ROORKEE

HYDRAULIC EXPERIMENTS.

BY

CAPT. ALLAN CUNNINGHAM, R.E.,
HON. FELLOW OF KING'S COLLEGE, LONDON.

VOL. II.-TABLES.

PART I. DETAILED TABLES.

PART II. ABSTRACT TABLES.

ROORKEE:
PRINTED AND PUBLISHED AT THE THOMASON COLLEGE PRESS.

1880.

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Experiment Staff

Superintendent, — — — Capt. Allan Cunningham, R.E.

Senior Observers, — — — { Dec. '74—Aug. '77, Sergt. J. Warburton, R.A.
{ Sept. '77—April '79, Sergt. W. Porter, R.E.

Senior Computer and Clerk, May '79—Nov. '81, Sergt. W. Porter, R.E.

[For detail of Observer and Computer Staff, see Text, Chap. II.]

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Sept. '77—April '79, Sergt. W Porters, R E.

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[For detail of Observer and Computer Staff, see Text, Chap II.]

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(iii) *Queried Results*—Results, such as Ranges, Means, Ratios, &c, depending on details of which some are either "doubtful" or "missing" (marked by a query as above) are themselves marked with a query, (indicating uncertainty). Again, Ranges and Means in any Sub Column containing fewer entries than the rest of the Series are (though correctly computed from their own data) also queried, to indicate that they are *not perfectly comparable* with the rest of the Ranges and Means of the Series.

(iv). *Edge-velocity*—Where required for insertion in Discharge-formulæ this quantity has been assumed zero where space admitted in the Sub Column of Edge-velocity this is distinctly stated; where the space was very contracted, the entry ?0 has been made; this should be read as "assumed zero in computing Discharge".

5. Leaders (.. ..)—These have been used both to fill up gaps in the Tables, and also to guide the eye across the page

These leaders (..)—when used to fill up gaps in the Tables—may be read to mean that "no figured entry is necessary in the space in question", (*see* Example in para 4—(ii))

6. Repeated Entries.—As a Rule all data required for each complete SET of Results were *independently obtained* But it often happened that several SETS of velocity-work were done in one day, whilst other data required for use with them were obtained only once or twice in the day, these last data have thus had to be *used more than once* to make the entries in each line or SET complete

To prevent such "repeated data" appearing to be independent observations, the entries are *repeated* by commas („), whenever they occur (as is usual) in successive lines

[In a few cases only, the lines in question do not run in succession in this case the "repeated data" have been printed in full in each line; this could not well be avoided. As a general Rule all data not repeated by commas may be looked on as *independent*]

7 Repetitions —To save the eye in reading the Tables, much repetition of figures has been avoided in certain columns by omitting the repeated figures, leaving them to be supplied by the reader, as follows —

Dates The day, month, and year where repeated are *replaced* severally by commas („).

Gauge Readings, and *Depths* (Central (H), Actual (d) at Gauge (h) Hydraulic Mean (R)). The leading integers when repeated are *omitted*, the decimal portion only being printed.

Surface-breadths (b) and *Wet Borders* (B). The leading integers when repeated are *omitted*, the decimal portion only being printed.

Surface-Slopes (S). The printed Slopes all contain only three figures three decimals (·000) are in every case to be prefixed by the reader, *e.g.*, the printed 230 is to be read as ·000230

9. **Abbreviation-Symbols.**—Some symbols or single letters have also been used by way of abbreviation or with special meanings,—not as algebraic symbols.

SYMBOL	MEANING
δ, Δ	Range, Discrepancy
C, T, W.	Copper, Wood, Tin
e, t, q, m	Edge, Top Immersed Step, Quarter point, Middle of Side-space.
L, R	Left, Right.
+, −	Water rose or fell, (in Column of "Variation").
+, −	*Used with special meanings in certain Tables, as therein explained*
< >	*[Detailed Tables* LXXV.-LXXVIII*, Abstract Tables* 26—31].
N, E, S, W	Direction of Wind *referred to current-axis as N S -Line*
V	Variable, (in Wind-direction column)
l, b, h, g	Light, Breeze, High Gusts (in Wind velocity column)
+	Used in Abstract Table 11 simply as a *separation* between formulæ

10. **Type.**—Different kinds of type are employed for sake of distinctness usually (but with occasional modification) as follows:—

Numbering of Detailed Tables, Black letter Roman numerals, I—LXXXVI.
" " Abstract Tables, Black letter Arabic numerals, 1—34.
" " Series, Black letter Arabic numerals, 1—262.
All the rest in Arabic numerals generally as follows:—
Number of Sets in old brevier, *e.g.*, 13
Detailed Depths, and Detailed Velocities, in old face, *e.g.*, 9·87, 3·65
Differences, Ranges, and Discrepancies, in old brevier, *e.g.*, ·07, 1·11
Data of Canal Control, in old brevier, *e.g.*, 10, 173·67.
All other Quantities usually in brevier, *e.g.*, 15·4, ·78, 9·35, 140·3, &c.
References to Tables, Series, &c., usually in same type as original.

11. **Preparation of Tables.**—The Tables have been prepared with great care; the system of checking used in the original preparation of the MS. is explained in the Text. In passing through the Press every *Proof* has been read with the MS. by one of the Computer Staff, (as well as by the usual Press Readers). All corrections were verified in the "Revised Proofs" by the Press Readers, by one of the Computer Staff, and by the Superintendent himself.

12. **Errata.**—With every care, it has, however, been impossible to avoid mistakes altogether. A good many Errata* were discovered whilst the Work was passing through the Press. Some of the worst of these have been corrected in a hand-press† so as to save trouble to the reader; these therefore no longer appear as Errata. A List of all the rest as far as known‡ is published below. The reader is requested to correct these with the pen.

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Differences, Ranges, and Discrepancies, in old brevier, *e g*, 07, 1 11
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ERRATA

Detailed Tables

Page	Table	Column	Sub-Column	Series	Lines of Series reckoned from		Erratum	Corrections
					Top.	Foot.		
60	XV	3	F_1	19	..	3	6 32	6 33
60	XXIX	7	D	52	..	last	3.77	[illegible]67
61	XXX	7	D	53	9	..	483 3	349 3
68	XXXIV	3	F_1	102	top	..	5.5	5.5
	"	4	T_1	102	..	5	? ?	? 10
71	XXXV	7	D	107		3	2 152	2,151
73	XXXVI	8	V	[illegible]			4 [illegible]	4 39
	"	.	V	[illegible]			3 81	3 56
74	XXXVII	3	F_1	111			4 87	? 4 87
"	"	4	From	"			SW 5	SW 4
"	"			"			NNW 1	N & W 1
							3 17	? 3 17
78				110				
80				1[illegible]				93
88				[illegible]				
91				1[illegible]				
10[illegible]				1[illegible]				
99	X		V					
10[illegible]			8					
108			To					
			From					
			Both				.. 0	
			"					
			V					
			D					
			V					
						last		
						last		55
						2		·012
						2		1·02
						2		2 013
								47
								44
								25·3

[illegible]

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Data of Canal Control, in old brevier, *e g*, 10, 173, 67.
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59	XXIX	7	D	52	..	last	327 7	326 7
61	XXX	7	D	53	9	..	483 3	348 3
68	XXXIV	3	F_1	102	top	..	555	5 55
"	"	4	To	102	..	5	? ?	? 70
71	XXXV	7	D	107	..	3	2,152	2,151
73	XXXVI	8	V	108	9	..	4 21	4 30
"	"	"	V	109	..	9	3 83	3 86
74	XXXVII	3	F_1	111	..	last	4 57	? 4 87
"	"	4	From	"	9	..	sW 6	sW 4
"	"	"	Both	"	..	last	NNW 1	N b W 1
"	"	6	41?L	"	..	last	3 17	? 3 17
78	XXXIX	3	S	118	3	..	224	"
80	XL	2	Varn	127	1	..	0	00
"	"	3	S	"	..	8	195	"
88	XLIV	4	Both	160	..	last	W 4	W b S 4
91	XLV	8	V	165	4	..	4 60	2 46
96	XLVIII	2	R	179	..	2	·10	·15
99	XLIX	8	V	191	top	..	4 19	4 16
106	LIII	3	S	218	top	..	168	158
108	LIV	4	To	223	..	7	NW 11	NW 9
"	"	"	From	"	..	6	NW 8	NW 11
112	LVI	4	Both	231	..	2	.. 0 | .. 0	.. | ..
"	"	"	"	232	..	2	.. 0 | .. 0	.. | ..
120	LX	8	V	113 115	..	2	16	26
122	LXI	3	D	124	1	..	722 1	722 2
"	"	"	"	127	1	..	35 5	35 6
123	LXI	3	V	131	..	last	74	1 24
"	"	3	D	"	..	last	482·0	481 9
"	"	4	c	"	..	last	883	838
124	LXII	4	R	151	..	last	? 935	? 9 35
126	LXIII	4	c	160	..	2	? 12	? 012
129	LXIV	5	w	176	..	2	? 03	? 1 03
130	LXV	4	c	193	..	2	? 19	? 019

ABSTRACT TABLES

14	9	6	0	4	2	..	..	·07
"	"	"	0	12	2	..	30	44
45	31	2	Date	..	..	16	8·2	28·2

N B—Certain Misprints in Series Nos. 2, 3, 6, 7, 13R, 16R of the 1874 5 Report have been corrected on transfer to this Work. Details of the Misprints in the Old Work are not required, as it is superseded by this Work.

PART I.

DETAILED TABLES.

TABLES I.—LXXXVI.

PART I.—DETAILED TABLES.

Tables I.—LXXXVI.

These Tables contain the *details* of the whole of the experimental data and also such Results as depend directly on them

Abstract of Contents.

	Tables	Pages.
Average Cross-Sections at the Experimental Sites, ..	I—IV,	1— 9
Hydraulic Elements at the principal (Soláni) Sites, ..	V, VI,	10— 12
Subsurface and Mean Velocities past a Vertical, ..	VII—XXVIII,	13— 56
Velocities past a Transversal, ...	XXIX.—XXXIII.,	57— 66
Mean Velocities and Cubic Discharges, ...	XXXIV.—LVI.,	67—113
Central Surface and Mean Velocities, ...	LVIII.—LXX.,	115—140
Miscellaneous Velocity Experiments, ...	LVII, LXXI—LXXIV,	114, 141—145
Water-Level, Surface-Convexity and Surface-Slope, ..	*LXXV.—LXXXII*,	146—151
Silt and Evaporation, ...	LXXXIII.—LXXXVI.,	152—156

A detailed Table of Contents follows.

DETAILED TABLES,—CONTENTS.

Table.	Page	TITLE, &c.
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...	1	——— Explanation of Tables
I	2- 3	——— at Fifteenth Mile and Soláni Embankment Main Site.
II, III, IV	4- 9	——— at Belra at Jaoli, and at Kamhera Sites
V	10- 11	Hydraulic Elements at Soláni Embankment Main Site
VI	12	——— at Soláni Right Aqueduct Site.
VII-XXVIII	13- 56	*Subsurface and Mean Velocities past a Vertical*
...	13	——— Explanation of Tables.
VII-XIX	14- 39	Subsurface and Mean Velocities past a Central Vertical.
VII-VIII	14- 17	——— Series 1- 4, Soláni Left Aqueduct.
IX XIV	18- 29	——— „ 5-17, „ Right Aqueduct.
XV	30- 31	——— „ 18-20, „ Right Aqueduct, (L. Aqued closed)
XVI-XIX	32- 39	——— „ 21-28 „ Embankment Main Site.
XX-XXVIII	40- 56	Subsurface and Mean Velocities past a Non Central Vertical.
XX-XXV	40- 51	——— Series 29-40 Soláni Right Aqueduct.
XXVI-XXVII	52- 55	——— „ 42-46, „ Embankment Main Site.
XXVIII	56	——— „ 41, „ Embankment Main Site
XXIX-XXXIII	57- 66	*Velocities past a Transversal*
.	57	——— Explanation of Tables
XXIX	58- 59	Surface Velocities, Series 51-52 Soláni Left Aqueduct.
XXX-XXXI	60- 63	„ „ „ 53 59 „ Right Aqueduct.
XXXII	64- 65	Mid depth Velocities, „ 61 62, „ Right Aqueduct.
	64- 65	Bed Velocities, „ 65-66, „ Right Aqueduct.
XXXIII	66	Surface Velocities, „ 60, „ Embankment Minor Sites.
XXXIV-LVI	67-113	*Mean Velocities and Cubic Discharges*
.	67	——— Explanation of Tables.
XXXIV XXXV	68- 71	——— Series 101-107, Soláni Left Aqueduct.
XXXVI-XL	72- 81	——— „ 108-127, „ Right Aqueduct.
XLI	82- 83	——— „ 131-139, „ Right Aqueduct, (L. Aqued. closed)
XLII-XLV	84- 91	——— „ 151-166, „ Embankment Main Site, High Water
XLVI-XLVIII	92- 97	——— „ 167 181, „ „ „ Low Water.
XLIX	98- 99	——— „ 191-197, Fifteenth Mile Sites.
L-LI	100-103	——— „ 201-206, Belra Site.
LII-LIII	104 107	——— „ 211 217, Jaoli Site.
LIV LV	108 111	——— „ 221 225, Kamhera Site
LVI	112-113	——— „ 231-238, Distributaries
LVII	114	Surface Bed and Mean Velocities and Discharges Series 241 243.

Table	Page	TITLE, &c
LVIII-LXX	115 140	*Central Surface and Mean Velocities*
	115	—— Explanation of Tables.
LVIII	116, 117	—— Series 101-107 Solani Left Aqueduct
LIX-LXI	118-122	—— „
LXI	123	—— „ ned closed)
LXII LXIV	124-129	—— „
LXV	130	—— „
„	131	—— „ 196-197, „ „ New Site
LXVI-LXVII	132-134	—— „ 201 206 Belra Site
LXVII-LXVIII	135-137	—— „ 211 217 Jaoli Site
LXIX	138, 139	—— „ 221 225 Kambera Site.
LXX	140	—— „ 231 233 Distributaries.
LVII & LXXI-LXXIV	114 141-145	*Miscellaneous Velocity Experiments*
	141	—— Explanation of Tables
LXXI	142	—— Experiments on Length of Run, Series 251
LXXII	143	—— „ „ „ „ 252
LXXIII	144	—— Unsteady Motion, Central Surface Velocities
LXXIV	145	—— „ „ Central Velocities
LXXV-LXXXII	146-151	*Water-Level, Surface Convexity, and Surface Slope*
	146	—— *Explanation of Tables.*
LXXV	147	—— *Still and Free Water Levels*
LXXVI	148	—— Effect of Wind on Water Level at Edges.
LXXVII	„	—— Convexity of Water Surface
LXXVIII	149	—— „ „ „
LXXIX	150	—— Surface Slope Measurements in 2000 & 4000 Slope Lengths
LXXX LXXXI	„	—— Surface Slope Measurements on both banks
LXXXII	151	—— Simultaneous Local Surface Slope Measurements
LXXXIII-LXXXVI	152-156	*Silt and Evaporation*
	152	—— Explanation of Tables.
LXXXIII	153	—— Silt-Densities, Velocities and Discharges Series 261, 262
LXXXIV	154	—— Silt Densities, and Discharges, Roorkee Reach
LXXXV	155	—— „ Belra Reach
LXXXVI	156	Evaporation at Solani Aqueduct and Kambera Sites.

TABLES I.—IV.

AVERAGE CROSS-SECTIONS AT THE EXPERIMENTAL SITES.

15th Mile Site, ...	Table I.
Solání Embankment Main Site, ...	„ „
Belra Site, ...	„ II.
Jaolí Site, ...	„ III.
Kamhera Site, ...	„ IV.

Each AVERAGE CROSS SECTION is the mean of eight Cross-Sections obtained by sounding at eight places along each Float-Course or line of Pendants in the manner explained in the Text, (see Art "Average Cross-Sections," *et seq*)

Col. 3.—The figures in "old face type" (3 02) show the AVERAGE HEIGHT of the Bed above a certain Datum, obtained from eight soundings along a Float-Course.

Col 3 —The figures in "old brevier type" (1 7) show the "Range" of the eight soundings, i e, the difference between the greatest and least depth along a Float-Course, and thus affords a measure of the roughness of the Bed

Foot of Table —The figures in italic type (*1·08*) show the variation of the Bed along a Float-Course during the whole Season, i e, the difference between the greatest and least Average Heights in that Float-Course.

TABLES V., VI.

HYDRAULIC ELEMENTS AT THE PRINCIPAL SITES.

[*Argument* —Height of Water Level above Datum = h].

(Central Depth = H, Surface-breadth = b, Wet Border = P, Area = A, Hyd. Mean Depth = R).

Solání Embankment Main Site, ...	Table V.
Solání Right Aqueduct Site, ...	Table VI.

AVERAGE

[*Instrument*—

15TH MILE

AVERAGE HEIGHTS

N.B.—The Datum is 20'

Each Average Cross-Section is

* The "Range" is the difference between greatest

1		2			3									
SITE.	Date, 1878 79	Water Level. Above Datum. A	Water Level. Variation.	Water Level. Central Depth H	Left of centre. 25	82½	80	75	70	65	60	40	20	Centre.
OLD SITE	28-3-'78	13 31	+ ·01	9 5'	12 22	10 96	9 92	8 33	7·06	5·75	5 45	3 13	3 02	4 33
	Range*	..	..	..	9	1 0	7	1 4	1 7	·1	·1	·6	2 0	1 1
	31-5-'78	15 30	+ 03	11 31	11 92	11 01	9·95	8 44	7 29	5 94	5 46	3 37	4 24	3·99
	Range*	..	..	..	·6	7	1 4	1 6	·5	8	·3	1 4	2 1	2 1
Range of Average Heights,				.	·30	·11	·03	·11	·23	·19	·01	24	1 22	·33
NEW SITE.	16-12-'78	15 20	– 04	9 85	..	..	6 20	5·95	5 86	5·68	5 40	5 31	5 29	5 44
	Range*	..	..	..	..	..	6	·3	·5	4	5	8	1 5	1 0
	28 4-'19	15 33	+ ·02	10 30	..	..	6 70	6 03	5 92	5 85	5 78	5 43	5 28	4 97
	Range*	..	..	..	..	..	9	·4	3	6	·3	1 2	1 5	2 9
Range of Average Heights,				..	..	..	50	·08	·06	·27	·38	12	·01	·47

SOLÁNÍ EMBANK-

AVERAGE HEIGHTS OF BED

N.B.—The Lower Datum is 3 below the

SITE	Date, 1876-78.	Above Datum A	Variation.	Central Depth H	Left of centre.	75	74½	72½	70	65	60	40	20	Centre
449 S OF 17TH MILE.	15-8-'76	2 20	?	3·44	..	2 62	2 64	2 39	2 20	1 92	2 06	1 58	1 62	1 62
	Range*	..	..	..	..	51	?	?	46	45	·44	20	52	·90
	4 6-'78	10 04	·00	11 24	..	2 69	?	?	2·19	1 84	1 90	·76	1 79	1 80
	Range*	..	..	..	..	90			60	·60	1 20	1 50	1 20	·70
	28-9-'78	3·13	– ·04	3·57	..	3 28	3 21	3 10	3 05	3·00	2·84	2 41	2 43	2 56
	Range*	..	..	..	..	1 25	1 10	65	·25	·70	·10	62	45	·70
	13-11-'78	9·10	00	10·03	..	2 61	2 53	2 53	2 19	2 19	2 06	1·09	1 41	2 16
	Range*	..	..	..	..	1 00	·30	·60	30	·40	1 20	1 40	2 00	1 50
	16-12-'78	10·03	– 04	11·00	..	2·64	?	?	2 40	2 15	2 19	63	1 68	1·97
	Range*	..	..	..	..	·70			1 00	1 20	1 20	1 80	1 60	80
Range of Average Heights,				.	..	·67	? ·65	? 71	86	1 16	94	1 78	1·08	·76

CROSS-SECTIONS. TABLE I.

15' *Sounding Rod*].

SITE.

OF BED ABOVE DATUM below 15th mile plinth. the Mean of eight Cross-Sections. and least soundings along a Float-Course									4				5
Right of centre.									Surface Breadth.	Wet Border	Area	Hyd Mean Depth	Reference to Plates
20	40	60	65	70	75	80	82½	85	b	B	A	R	
4 66 1 5	4 71 2 2	5 97 7	6·37 8	6 56 9	7 22 1 9	8 95 1·0	9 31 6	10 51 1 5	174 9	179 2	1484 4	8·22	Pl. II., Fig 1.
4 77 1 6	4 92 1 5	6·40 3	6·55 ·7	6·76 1 0	7 54 2 9	9·07 1 3	9 44 1 1	9 82 1 6	174 9	181 6	1706 5	9·40	..
·11	·21	43	·18	20	·32	·12	13	·29	..	..	..	..	..
5 46 3	5 39 ·3	5 64 ·4	5 10 ·3	5 80 4	5 86 3	6·04 1·0	..	..	186·3	192 1	1687 1	8 78	Pl. II., Fig 1.
5 50 1 5	5 28 ·7	5 73 ·3	5 83 ·4	5 75 ·4	5 88 ·3	5 98 ·2	..	..	186·0	191 7	1700·0	8·81	..
·01	·11	09	·13	·05	·02	·06	..	..	..	..	..	..	..

MENT MAIN SITE.

ABOVE LOWER DATUM. Upper Datum or original Bed level.													
Right of centre.									Surface-Breadth	Wet Border	Area.	Hyd M. Depth.	Reference to Plates.
20	40	60	65	70	71½	73½	74		b	B	A	R	
1 26 1 00	1·05 60	1 56 1 53	2·06 ·70	2 34 ·40	2 11 ?	2 24 ?	2 34 ·18	..	150·0	155·7	543·1	3·49	Pl. II., Fig 2
1 49 1 10	1 85 1 80	1 20 1·30	2 23 1 00	2 24 ·50	?	?	2 35 90	..	171·0	192 2	1809·3	9 41	..
2·05 ·95	2·05 ·50	2·01 80	2 37 30	2 50 1 00	2·69 ·55	2 79 ·97	3·03 1 13	..	150·0	156·1	554·7	3·55	..
1·83 1 50	1·06 1 60	1 23 1 90	2 19 ·70	2 38 ·80	2 45 90	2 48 1 00	2·69 1 00	..	167·[illegible]	186·7	1623·9	8·72	Pl. II., Fig 2
1 24 1 00	·87 2 50	1 29 2 40	2·01 ·40	2 35 ·70	?	?	2 40 1 00	..	171·0	200·9	1799·2	8·96	..
81	1·18	87	·35	26	1 ·55	1 55	·69	..	..	..	..	..	..

AVERAGE

[*Instrument—*

15TH MILE

Site.	1 Date, 1878 79	2 Water Level. Above Datum A	 Variation.	 Central Depth H	3 Average Heights N.B.—The Datum is 20' Each Average Cross-Section is * The "Range" is the difference between greatest Left of centre. 85	 87½	 80	 75	 70	 65	 60	 40	 20	 Centre.
OLD SITE	28 3 '78	13 91	+ ·01	9 59	12 21	10 96	9 92	8 33	7 06	5 75	5·45	3 13	3 02	4 32
	Range*	..	..	..	9	1 0	7	1 4	1 7	7	1	·6	2 0	1 1
	31 5-'78	15 30	+ 03	11 21	11 92	11 07	9 95	8 44	7 29	5 94	5 46	3 37	4 24	3 99
	Range*	..	..	..	6	·7	1 4	1 6	·5	8	·3	1 4	2 7	2 1
Range of Average Heights,				.	*30*	*·11*	*03*	*11*	*23*	*·19*	*·01*	*24*	*1 22*	*33*
NEW SITE	16-12-'78	15 29	– 04	9 83	..	..	6 20	5·95	5 86	5 68	5 40	5 31	5 29	5 44
	Range*	..	..	..	..	..	6	3	5	4	5	8	1 5	1 0
	28 4 '79	15 33	+ 02	10 30	..	..	6 70	6·03	5 92	5 85	5 78	5 43	5 28	4 97
	Range*	..	..	..	..	..	9	·4	3	6	3	1 2	1 5	2 1
Range of Average Heights,				.	..	.	*50*	*·08*	*·06*	*·17*	*38*	*12*	*01*	*47*

SOLÁNI EMBANK-

Site	Date, 1878 79.	Above Datum. A	Variation.	Central Depth H	Average Heights of bed N.B.—The Lower Datum is 3 below the Left of centre. 	 75	 73⅓	 72½	 70	 65	 60	 40	 20	 Centre
449 S OF 17TH MILE	15-8-'76	2 20	?	3·44	..	2 62	2 64	2 39	2 20	1 92	2 06	1 55	1 62	1 82
	Range*	..	..	..	..	51	?	?	46	45	44	20	52	90
	4 6-'78	10 04	00	11 24	..	2 69	?	?	2 19	1 84	1 90	·76	1 9	1 80
	Range*	..	..	..	..	90			60	60	1 20	1 50	1 20	70
	28-9-'78	3·13	– ·04	3·57	..	3 28	3 21	3 10	3 05	3·00	2 84	2 41	2 43	2 56
	Range*	..	..	..	..	1 25	1 10	65	25	·70	70	62	45	·70
	13-11 '78	9·19	00	10·03	..	2 61	2 53	2 53	2 19	2 19	2 06	1·09	1 41	2 16
	Range*	..	..	..	..	1 00	80	60	30	·40	1 20	1 40	2 00	1 50
	16-12-'78	10·03	– 04	11·00	..	2·64	?	?	2 40	2 15	2 19	63	1 68	1·97
	Range*	..	..	..	..	·70			1 00	1 20	1 20	1 80	1 60	80
Range of Average Heights,				.	..	*·67*	*1 ·65*	*1 71*	*85*	*1 16*	*91*	*1 78*	*1 04*	*76*

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM below 15th mile plinth. the Mean of eight Cross Sections. and least soundings along a Float-Course									4				5
Right of centre									Surface-Breadth.	Wet Border	Area	Hyd. Mean Depth	Reference to Plates
20	40	60	65	70	75	80	82½	85	b	D	A	R	.
4 66 1 5	4 71 2 2	5 97 7	6 37 8	6 56 9	7 22 1 9	8 95 1 0	9 31 6	10 31 1 5	174 9	179 2	1484 4	8 29	Pl II., Fig 1
4 77 1 6	4 92 1 5	6 40 3	6 55 7	6 76 1 0	7 54 2 9	9·07 1 3	9 44 1 1	9 82 1 6	174 9	181 6	1706 5	9 40	..
11	*21*	*43*	*18*	*20*	*32*	*·12*	*13*	*·49*		..	..	..	..
5 46 3	5 39 3	5 64 4	5 70 ·3	5 80 4	5 86 3	6·04 1·0	..	..	186 3	192 1	1687 1	8 76	Pl. II., Fig. 1.
5 50 1 5	5 28 7	5 73 3	5 83 ·4	5 75 4	5 88 3	5 98 2	..	..	186·0	191 7	1700·0	8·87	..
·04	*11*	*09*	*13*	*05*	*·02*	*·06*	..	..	..	..	..	.	..

MENT MAIN SITE

ABOVE LOWER DATUM. Upper Datum or original Bed-level.									Surface Breadth	Wet Border	Area	Hyd. M Depth.	Reference to Plates.
Right of centre													
20	40	60	65	70	73½	73¾	75		b	D	A	R	
1 26 1 00	1 05 60	1 36 1 53	2 06 70	2 34 40	2 11 ?	2 24 ?	2 34 18	..	150·0	155 7	543·1	3·49	Pl. II., Fig 2
1 49 1 10	1 85 1 80	1 20 1·30	2 73 1 00	2 24 50	?	?	2 35 90	..	171·0	192 2	1809·3	9 41	..
2·05 ·95	2·05 50	2·0, 80	2 37 30	2 50 1 00	2 69 85	2 19 97	3·03 1 13	..	150 0	156 1	554·7	3·55	..
1·83 1 50	1·06 1 60	1 23 1 90	2 19 70	2 38 ·80	2 45 90	2 48 1 00	2 69 1 00	..	167·5	166·7	1628·9	8·7.	Pl. II., Fig 2
1 24 1 00	·87 2 50	1 29 2 40	2·02 40	2 35 70	?	?	2 40 1 00	..	171·0	200·9	1799 2	8 96	..
81	*1·18*	*85*	*·35*	*26*	*1 58*	*1 55*	*·09*	..	..	..	..	..	..

AVERAGE

[*Instrument—*

BELRA

Site.	1	2			3									
		WATER LEVEL			AVERAGE HEIGHTS The Datum is 4' Each Average Cross-Section is * The " Range " is the difference between greatest									
	Date, 1879	At Gauge.	Variation	Central Depth				Left of centre.						Centre.
		A		H				90	80	70	60	40	20	
BELRA.	8-1-'79	7 53	·00	9 6	..	..	..	5 11	2 01	1 69	1 74	2 02	1 39	1 87
	Range*	..	..	..	..	..	..	2 4	2 0	1 1	1 3	1 4	1·0	1 2
	13-1-'7	6 71	− 40	8 90	..	..	..	4 75	1 86	2 01	1 81	1·88	1 67	1 81
	Range*	..	..	..	..	..	..	1 6	1 0	·9	1 1	1 4	1 1	1 1
	20-1-'79	7 03	00	9 71	..	..	..	4 92	1 97	1 81	1 77	1 91	1 90	1 34
	Range*	..	..	..	..	..	..	1 3	1 9	1 1	1 3	1 5	5	1 5
	29-1-'79	6·39	+ ·03	8 71	..	..	..	4 50	2 01	1·83	2 06	1 94	1 85	1 68
	Range*	..	..	..	..	..	..	4	1 7	1 0	1 2	1 0	1 2	1 8
	5-2 '79	6 28	·00	8 54	..	..	..	4 42	2 03	1 82	2·00	1·79	1 65	1 74
	Range*	..	..	..	..	..	..	·3	2 2	1 0	1 1	1 4	1 0	1 3
	12 2-'79	5 89	− 02	8 13	..	..	..	4 60	1 91	1 74	1 61	1 81	1·83	1 76
	Range*	—	..	..	..	..	..	1 0	2 0	7	1 2	·8	3	6
	19 2-'7	6 50	+ ·04	8 6	..	..	..	4 44	1 75	1·70	1 70	1 69	1 75	1 81
	Range*	..	..	..	..	..	..	1 1	1 8	·9	1·1	·9	1 3	1 0
	26 2-'7	6 03	− 03	8 86	..	..	..	4 58	1 78	1 60	1·72	1 68	1 75	1 77
	Range*	..	..	..	..	..	..	1 0	1 9	1 2	2	8	1 5	1 2
	5 3-'79	5 94	·00	8 23	..	..	..	4 41	1 66	1 61	1 95	1 76	1 76	1 71
	Range*	..	..	..	..	..	..	·6	1 7	·7	·5	·6	1·1	1 0
	12 3-'7	5 60	·00	7 83	..	..	..	4 42	1 74	1 64	1 72	1 71	1 77	1 77
	Range*	..	..	..	..	..	..	1 2	1 4	·6	6	7	·8	5
	19-3-'7	7 02	− ·04	9 21	..	..	..	4 28	1 73	1 59	1·82	1·66	1 69	1·81
	Range*	..	..	..	..	..	..	·7	2 1	7	9	1 1	1 2	4
	26-3-'7	7 23	− 05	9 58	..	..	..	4 64	1 68	1 69	1 45	1 57	1·83	1·65
	Range*	..	..	..	..	..	..	·9	1 8	6	1 0	9	1 1	9
Range of Average Heights,				.	..	..	..	[illegible]	·37	·42	61	·35	51	53

CROSS-SECTIONS **TABLE II.**

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM below Gauge-Zero the Mean of eight Cross Sections and least soundings along a Float-Course.									4				5
Right of centre									Surface-Breadth.	Wet Border	Area	Hyd Mean Depth	Reference to Plates
20	40	60	70	80	90				b	B	A	R	
1 39 2 0	1 24 1 0	1·04 1 1	1 16 8	1 81 2 1	5 51 3 8	.. ..	.. .	.. ..	188 5	196 3	1776·3	9·0	Pl IV, Fig 3
1 68 7	1 31 8	1 30 8	1 13 1 1	1 68 1 8	5 15 2 3	.. ..	.. ..	.. ..	187 7	194 9	1626 4	8 35	
1 49 1 0	1 07 1 2	1 37 1 0	89 2 0	1 70 1 9	5 07 2 3	. ..	.. ..	.. ..	188·0	195 6	1715 5	8 77	
1 64 5	1 44 1 1	1 23 1 5	1 45 8	1 [illegible] 2 0	4 45 1 7	.. ..	.. ..	..	187 4	194 6	1564 3	8 04	
1 44 1 3	1 25 1 0	1 40 1 5	1 24 7	1 82 1 5	4 47 1 2	.. ..	.. ..	.. ..	187 3	194 4	1535·0	8·00	
1 56 7	1 38 8	1 45 ·7	1·61 9	1 74 1 7	4 71 1 4	.. ..	.. ..	.. ..	186 9	193 3	1475 3	7 6	
1 51 1 2	1 32 1 5	1 29 1 1	1 37 8	1 74 1 9	4 81 1 0	.. ..	.. ..	.. ..	187 5	194 8	1599 4	8·21	
1 52 1 0	1 18 8	1 47 8	1 20 1 0	1 69 1 5	4 59 1 2	. ..	.. .	.. ..	187·6	194·7	1631·3	8 38	
1 49 1 0	1 35 1 0	1 58 8	1·44 9	1 80 1 6	4 80 1 7	.. ..	.. .	.. ..	186 9	193 6	1491 2	7 70	
1 56 9	1 64 5	1 59 6	1 79 9	1 76 1 1	4 61 1 5	.. ..	.. ..	.. ..	186 6	192 9	1414 7	7·33	Pl. IV., Fig 3
1 28 6	1 17 1 5	1 38 1 3	1 28 1 5	1 61 1 3	4 9[illegible] 1 8	.. ..	.. ..	.. ..	[illegible]	196·0	170[illegible]·7	8·70	
1 47 1 1	1 23 1 3	1 57 1 2	97 1 4	1 60 1 9	4 99 2 4	.. ..	.. ..	.. ..	188·2	196·3	1752 2	8 93	
40	*57*	*55*	*90*	*22*	*106*	..	.	..	..	.	..	.	

AVERAGE

[*Instrument*—

JAOLI

AVERAGE HEIGHTS

The Datum is Y'

Each Average Cross Section is

* The "Range" is the difference between greatest

SITE.	1 Date 1879	2 WATER LEVEL At Gauge A	Variation	Central Depth. H		3 Left of centre 97½	90	82½	75	67½	60	40	20	Centre
JAOLI	4 1-79	7 04	+ 04	8 43	..	3 33	3 08	2 60	1 93	2 04	2 11	1 93	1 73	1 61
	Range*	..	..	..	..	6	10	9	10	7	8	9	11	7
	13 1-'79	6 53	− 26	7 04	..	3 21	3 06	2 67	1 71	2 01	1 95	1 69	1 86	1 91
	Range*	..	.	..	..	5	7	15	10	8	9	9	8	6
	20 1-'79	6 80	− 02	8 2	..	3 10	3 14	2 70	1 80	1 76	1 87	1 67	1 65	1 57
	Range*	..	..	--	..	6	5	15	9	6	5	8	8	7
	29 1 '79	5 86	− 04	7 19	..	3 31	3 10	2 62	1 61	1 66	1 61	1 72	1 70	1 67
	Range*	..	..	..	..	·8	9	14	4	5	7	5	2	6
	5-2 '79	5 58	− 06	6 93	..	3 34	3 15	2 59	1 72	1 70	1 77	1·70	1 60	1 63
	Range*	..	..	..	..	6	6	14	11	4	3	3	3	3
	12 2 '79	5 40	00	6 80	..	3 30	3 16	2 56	1 60	1 56	1 57	1 65	1 59	1 54
	Range*	..	.	..	..	6	6	12	10	3	2	2	2	4
	19 2 79	6 30	00	7·6	.	3 34	3 21	2 49	1 69	1 70	1 67	1 64	1 65	1 65
	Range*	,	..	..	..	6	6	16	8	5	6	2	5	6
	26-2 79	6 35	+ 02	7 7	..	3 34	3 20	2 52	1 66	1 61	1 60	1 80	1 57	1 62
	Range*	..	..	..	..	5	5	15	10	7	7	5	2	7
	5-3 79	5 63	00	7·0	..	3 30	3 18	2 40	1 70	1 60	1 64	1 58	1 64	1 60
	Range*	..	..	..	..	·5	4	16	13	4	6	5	3	3
	12-3-79	5 15	·00	6 60		3 27	3·07	2 42	1 57	1 52	1 51	1 54	1 50	1 49
	Range*	..	..	..	..	6	6	14	11	5	5	3	3	1
	19-3-79	6·60	+ 02	8 04	..	3 33	3 10	2 51	1·80	1 70	1 69	1 65	1·69	1 65
	Range*	..	..	..	..	8	19	17	9	5	6	8	5	·7
	26-3-79	7·00	− ·06	8·2	..	3 31	3 0	2·34	1 71	1 70	1 75	1 79	1 84	1 71
	Range*	..	..	..	..	9	9	16	11	6	6	7	7	9
Range of Average Heights,				.	.	*21*	*15*	*·36*	*36*	*52*	*60*	*39*	*36*	*42*

CROSS-SECTIONS **TABLE III**

15′ *Sounding Rod*]

SITE

OF BED ABOVE DATUM
below Gauge Zero.
the Mean of eight Cross-Sections
and least soundings along a Float-Course

									4				5
Right of centre.									Surface Breadth	Wet Border	Area	Hyd Mean Depth	Reference to Plates.
20	40	60	67½	75	82½	87½	92½		b	B	A	R	
1 75 1 3	1 51 8	1 16 1 1	1 40 5	1 76 3 2	3 06 2 3	3 53 1 3	4 34 1 6	·	192 6	199 8	1527 7	7 64	Pl V, Fig 3
1 89 7	1 62 9	1 20 6	1 22 4	1 67 2 8	3 01 2 7	3 67 1 8	4 39 1 4		192 1	198 8	1451 0	7 20	
1 72 3	1 52 6	1 32 6	1 24 4	1 79 2 8	2 97 2 5	3 65 1 8	4 40 1 5	..	192 4	199·5	1496·0	7 50	
1 61 5	1 43 7	1 31 7	1 18 8	1 73 2 8	2 87 3 2	3 57 1 6	4 36 1 5	..	191 4	197 3	1321 9	6 70	
1 48 7	1 44 4	1 08 6	1 15 6	1 64 3 6	3 14 2 2	3 75 1 0	4 37 1 8	..	191 1	196 6	1280 8	6 51	
1 45 3	1 34 3	1 10 5	1 09 6	1 60 2 6	2 91 2 7	3 54 1 9	4 30 1 7	..	191 0	196 1	1249·6	6 37	
1 41 4	1 31 6	1 17 6	1 05 5	1 50 2 2	2 92 2 8	3 56 1 8	4 34 1 6	..	191 9	198 2	1415·7	7 14	
1 45 6	1 35 9	1 17 7	1 09 8	1 72 2 9	2 86 2 9	3 66 1 6	4 39 1 4	..	191 9	198 2	1419 7	7 10	
1 50 2	1 43 4	1 17 5	1 07 6	1 53 2 7	2 87 2 5	3 59 1 7	4 29 1 4	..	191 2	196 8	1288 8	6 5	
1 34 6	1 30 4	1 04 5	99 7	1 54 2 9	2 97 2 5	3 59 1 6	4 25 1 7	..	190 7	195 8	1213 4	6 20	Pl. V, Fig 3.
1 55 7	1 24 7	1 00 8	1 10 8	1 60 3 1	2 88 2 7	3 54 1 8	4 28 1 4		192 2	199 1	1491 3	7 4	
1 56 9	1 50 1 0	1 04 3	1 97 3	1 60 29	2 93 2 7	3 46 1 8	4 30 1 3	·	192·6	199 9	1537·0	7 70	
55	*·03*	*·02*	*·13*	*29*	*25*	*29*	*15*				·		

AVERAGE

(*Instrument*—

KAMHERA

	1	2			3									
		WATER LEVEL.			AVERAGE HEIGHTS OF BED Each Average Cross-Section is * The "Range" is the difference between greatest									
					Left of centre.									Centre.
SITE	Date 1879	At Gauge h	Variation	Central Depth H		30	27½	25	22½	20	15	10	5	
KAMHERA	1-1-79	6·02	·00	3·20	..	3·34	1·93	1·12	·97	·91	·74	·72	·89	·76
	Range*		..	.	.	1·9	1·3	·5	·9	·4	1·3	1·1	·6	1·2
	13-1-79	5·50	–·03	4·91		3·34	1·84	1·00	·92	·92	·79	·82	·86	·89
	Range*	.	..	.		2·1	1·6	·3	·5	·4	·6	·4	·6	·5
	20-1-79	5·05	·00	4·85		3·25	1·69	·93	·93	·92	·93	·88	·79	·75
	Range*		..	.		1·6	1·3	·5	·7	·6	·9	·6	·6	·5
	29-1-79	6·17	·00	5·27	..	3·29	1·83	·93	·98	·81	·71	·9	1·04	·92
	Range*	..	..	..	..	2·7	1·7	·4	1·1	1·0	·9	1·0	1·0	·5
	5-2-79	6·44	·00	5·34	..	3·21	1·78	1·03	·99	·94	·93	·91	·96	·90
	Range*	.	..	..	.	2·4	1·7	·4	·8	·7	1·0	2·0	·4	·5
	12-2-79	5·47	–·03	4·50	..	3·17	1·85	·79	·71	·84	·58	·81	·83	·71
	Range*		..	.		2·4	1·8	·6	·8	·3	·6	·6	·9	1·1
	19-2-79	5·34	·00	4·6	..	2·79	1·56	·81	·61	·64	·65	·81	·71	·69
	Range*				.	2·5	1·9	·7	·6	·4	·6	·4	·5	·6
	26-2-79	5·97	–·10	5·16	.	3·09	1·72	·78	·71	·79	·63	·8	·84	·79
	Range*	..	.		..	2·6	1·7	·3	1·0	·9	1·1	·4	·4	·3
	5-3-79	5·20	·00	4·5	..	2·82	1·82	·89	·70	·57	·63	·56	·71	·75
	Range*	..	..	..	..	2·9	1·9	·6	·8	·8	·6	·6	·6	·6
	12-3-79	5·34	·00	4·6	..	3·12	1·64	·93	·65	·70	·75	·65	·69	·83
	Range*	..	..	.	..	2·5	2·0	·7	1·1	1·1	·3	·7	1·0	·3
	19-3-79	5·22	–·01	4·75	..	2·96	1·84	·88	·73	·66	·49	·63	·66	·47
	Range*	..	..	..	..	2·3	1·9	·4	·6	·6	·4	·3	·6	1·1
	26-3-79	5·61	·00	4·97	..	3·02	1·62	·76	·70	·68	·65	·60	·72	·61
	Range*	.	..	..	.	3·0	1·8	·7	·7	·8	·8	·5	1·1	·7
Range of Average Heights,				.	.	·52	·37	·46	·32	·35	·44	·46	·35	·45

TABLE IV

CROSS SECTIONS

11′ *Sounding Rod*]

SITE

ABOVE GAUGE ZERO the Mean of eight Cross-Sections and least soundings along a Float-Course.									4				5
Right of centre									Surface-Breadth	Wet Border	Area	Hyd Mean Depth	Reference to Plates.
5	10	15	20	22½	25	27½	m		S	B	A	R	
92 1 1	81 1 1	97 5	·92 4	89 7	98 8	1 73 1 5	3 53 1 3	.. ..	63 0	68 4	305 2	4 46	
·92 6	94 5	81 5	91 4	·94 5	91 2	1 89 8	3·94 1 5	. ..	64 6	67 8	288 8	4 20	
73 5	79 1 2	75 8	78 5	80 5	89 4	1 85 9	3 74 1 1	.	64 8	67 4	281 3	4 18	
81 8	64 1 1	6 1 0	8 7	81 9	84 6	1 71 7	3 94 4	.. .	65 3	68 8	313·0	4 5	
88 8	75 5	69 4	69 1 0	65 6	81 8	1 64 7	3 69 1 2	.. ..	65 4	69 4	334 5	4 8	Pl. VI., Fig 3.
84 8	59 8	49 5	72 4	69 4	78 3	1 58 1 2	3 51 1 2	.. ..	64 2	67 4	282 4	4 1	
61 7	73 4	49 8	64 3	63 3	·64 4	1 45 1 0	3 58 1 0	.. ..	64 1	67 3	277 5	4 12	
62 1 0	62 7	6 9	67 7	74 6	72 4	1 47 7	3 93 1 5	.. ..	65 2	68 8	310 9	4 5	
62 4	74 6	77 5	60 5	55 5	61 4	1 45 1 4	3 57 1 5	. ..	64·0	67 1	270 8	4·04	
58 5	65 6	49 1 2	63 5	48 3	55 4	1 40 1 1	3 75 1 8	..	64 2	67 3	276 5	4 11	
62 6	59 3	63 4	53 6	52 5	67 5	1 36 6	3 57 8	.. ..	63 0	66 9	268 5	4 0	Pl. VI., Fig 3.
75 8	46 ·9	57 8	56 8	55 6	61 5	1 58 8	3 71 1 2	.. ..	64 5	67·9	291 5	4·2	
34	*35*	*45*	*39*	*46*	*33*	*·55*	*43*			•			

HYDRAULIC ELEMENTS TABLE V

SOLANI EMBANKMENT MAIN SITE PERIOD, SEPT 1876 TO 24TH AUG 1878

For References, see next page

A	H	s	B	A	R	Trend	Bank	A	H	s	B	A	R	Trend	Bank
35	1 53	150·0	151 8	256 6	1 69										
1 84	3·02	-0	154 8	480 1	3 10										
85	03	0	8	481 6	11										
99	17	0	155 1	502 6	24										
2 00	18	0	1	504 1	25										
30	48	-0	7	549 1	53										
33	51	-0	8	553 6	55										
40	58	0	9	564 1	61										
47	65	0	156 1	574 6	68										
49	67	-0	1	577 6	70										
55	7[illegible]	0	2	586 6	75										
87	4 05	0	9	634 6	4 05										
90	08	0	9	639 1	0[illegible]										
91	09	0	157 0	640 6	08										
92	10	-0	-0	642 1	09										
3 04	22	0	2	660·1	20										
40	58	0	9	714 1	52										
50	68	0	158 1	729 1	61										
60	78	0	3	744 1	70										
70	88	0	5	759 1	79										
80	98	0	7	774 1	85										
85	5·03	0	8	781 6	9	12th,	R								
86	·04	151 2	160 0	783 2	89										
90	08		1	789 [illegible]	93										
4 00	18	2	3	804 3	5·02	12th,	L								
01	19	152 3	161 5	805 8	4 99										
10	28	3	7	819 6	5 07										
20	·38	3	9	834 8	16										
30	48	3	162 1	850 0	24										
40	58	3	3	865·3	33										
50	68	3	5	880 5	4[illegible]										
59	77	3	7	894 2	50	11th,	R								
60	78	153 5	163 8	895 7	47										
70	88	5	164·0	911 1	55										
73	91	5	1	915 7	58	11th,	L								
74	9[illegible]	154 7	165 3	917 2	55										
80	98	[illegible]	4	926 5	60										
90	6 08	7	6	94[illegible] 0	6[illegible]										
5 00	18	[illegible]	8	957 5	78										
10	25	7	166 0	9[illegible]2[illegible]	·86										
20	38	7	2	988 4	95										
30	48	7	4	1003 9	6·04										
35	53	[illegible]	5	1011 6	·08	10th,	R								
36	54	155 8	167 7	1013 1	01										
40	58	8	8	1019·4	·08										
4[illegible]	·65	8	9	10[illegible]0·3	14	10th,	L								
45	66	157 0	169 1	1031 9	10										
50	68	[illegible]	1	1035 0	1[illegible]										
60	78	0	·3	1050 7	20										
70	88	-0	5	1066 4	29										
80	98	-0	7	1082 1	·37										
90	7·0[illegible]	-0	9	1097 8	46										
6·00	18	0	170·1	1113 5	54										
·0	[illegible]	-0	3	11[illegible]4·5	60	9th,	R								
08	[illegible]6	158·2	171 5	1126·1	57										
10	[illegible]	[illegible]	5	11[illegible]9 2	59			10 00	18	0	1	1 69 5	21		
20	·35	2	[illegible]	1145·0	67	9th,	L	03	[illegible]	-0	2	1778·0	25		
21	[illegible]	159·3	172 9	1146·6	·6[illegible]										

TABLE V, (*continued*)

For Cross-Section, see Plate II Fig 2

The Treads of the 12 steps on each bank are numbered from the top (No. 1) downwards to the lowest (No 12)

Argument.—*h* — Height above Datum.

H = Central Depth *b* = Surface-Breadth B = Wet Border A = Area R = Hydraulic Mean Depth

SOLANI EMBANKMENT MAIN SITE PERIOD, 24th AUG '78 TO APRIL '79

h	H	*b*	B	A	R	REMARKS	
						Depth below Tread of 12th Step on left bank	Date
1 64	2 27	150·0	153 2	342·5	2 24	2·30 below 12th	18- 9 '78
69	33	0	3	350 0	28	2 31 ,, ,,	19 ,, ,,
2 82	3·26	0	155 4	508 3	3 27	1 18 ,, ,,	24- ,, ,,
83	27	·0	·5	509·8	28	1 17 ,, ,,	26- ,, ,,
3 44	88	0	156 7	601 3	84	56 ,, ,,	4 10 ,,
47	91	0	7	605·8	86	·53 ,, ,,	8 ,, ,,
49	93	0	8	608 8	88	51 ,, ,,	8 ,, ,,

h	H	*b*	B	A	R	REMARKS	
						Height above Tread of Step on left bank.	Date
8 29	9 32	164 0	181 7	1503 3	8 30	·7 above 7th	2- 4-'79
82	66	166 3	184 8	1567 6	48	35 ,, 6th	23 10-'78
9 08	10 11	167 5	186 8	1639 7	77	61 ,, ,,	7 12- ,,
43	46	168 7	188 7	1698 5	9 00	23 ,, 5th	15- 4 '79
57	41	7	7	1694 2	8 93	37 ,, ,,	18-11-'78
58	42	7	7	1695 9	99	·38 ,, ,,	18- ,, ,,
60	44	7	7	1699·3	9 00	40 ,, ,,	19- ,, ,,
88	91	169 8	190·7	1774 5	·30	68 ,, ,,	20-12- ,,
91	94	8	8	1779 6	·33	71 ,, ,,	19- ,, ,,
93	96	8	·8	1783·0	·34	73 ,, ,,	19- ,, ,,
95	98	8	9	1786 4	·36	75 ,, ,,	18- ,, ,,
10·04	11 07	171·0	192 2	1800·9	·37	·08 ,, 4th	14- ,, ,,

TABLE VI

HYDRAULIC ELEMENTS

SOLANI RIGHT AQUEDUCT

For Cross-Section, see Plate II., Fig 4 and (on large scale Plate I. Fig 3.

Argument —h = Depth at Gauge.
H = Central Depth, b = Surface-breadth, B = Wet Border A = Area, R = Hydraulic Mean Depth.

h = H	b	B	A	R	Remarks.	h = H	b	B	A	R	Remarks.
70	84·34	85 04	58 72	69		6 60	85 00	96 95	559 93	5 78	
1 92	85·00	87 59	162 13	1 85	Top of curve.	70	00	97 15	568 43	85	
2 00	"	75	168 93	93		80	00	35	576 93	93	
02	"	79	170 63	95		90	00	55	585 43	6·00	
00	"	88 95	219 93	2 47		7 00	00	75	593 93	08	
66		89 07	225 03	53		10	00	95	602 43	15	
71	"	17	229 28	57		20	00	98 15	610 93	22	
88	"	51	243 73	72		29	·00	·33	618 58	29	Offset.
3 00	"	75	253 93	83		30	84 50	·85	619 43	27	
13	"	90 01	264 98	94		40	50	99 05	627 86	34	
18	"	11	269 73	99		50	49	25	636 33	41	
53	"	91	303 23	3 33		60	48	45	644 78	48	
60	"	95	304 93	35		70	46	65	653 23	·56	
95	"	91 65	334 68	65		80	44	85	661 67	63	
99	"	73	338 08	68		90	41	100·05	670 11	70	
4 00	"	75	338 93	69		8 00	38	25	678 55	77	
10	"	95	347 43	78		10	34	45	686 99	84	
20	"	92 15	355 93	86		20	30	65	695·42	91	
30	"	35	364·43	95		30	24	87	703 85	98	
40	"	55	372 93	4 03		40	18	101 09	712 27	7·05	
50	"	75	381 43	11		50	12	31	720 68	11	
60	"	95	389 93	20		60	04	53	729 09	18	
70	"	93 15	398 43	28		70	83 96	75	737·49	25	
80	"	35	406 93	36		80	86	99	745 88	31	
90	"	55	415 43	44		90	74	102 75	754 26	·38	
5 00	"	75	423 93	52		9 00	61	·52	762 63	44	
10	"	95	432 43	·60		10	45	·81	770·98	50	
20	"	94 15	440·93	·68		20	25	103·13	779 32	56	
30	"	35	449 43	76		30	82 97	·53	787 63	61	
·40	"	55	457 93	84		37	48	104 12	793 43	62	Quadrant Head
50	"	75	466 43	92		·40	48	18	795·90	64	
60	"	95	474 93	5·00		50	48	·39	804 15	70	
70	"	95·15	483·43	·08		60	·48	59	812 40	77	
80	"	·35	491 93	16		70	48	78	820·65	83	
90	"	55	500·43	24		80	48	98	828 90	90	
6 00	"	75	508·93	32		84	48	105·06	832 20	92	
10	"	95	517 43	·39		85	·00	·06	833·02	89	Offset
20	"	96 15	525·93	47		90	·00	66	837 12	92	
·30	"	·35	534 43	55		10 00	·00	·86	845·32	99	
40	"	·55	542 93	·62		10	·00	106·06	853·52	8·05	
50	"	75	551·43	70							

TABLES VII.—XXVIII

SUBSURFACE AND MEAN VELOCITIES PAST A VERTICAL

CENTRAL VERTICAL.

Solání Left Aqueduct Site, ...	Series 1 to 4,	Tables VII, VIII
Solání Right Aqueduct Site, ...	Series 5 to 17,	„ IX. to XIV.
Solání Right Aqueduct Site, with Left Aqueduct closed, ..	Series 18 to 20,	„ XV.
Solání Embankment Main Site,	Series 21 to 28,	„ XVI. to XIX.

NON-CENTRAL VERTICALS.

Solání Right Aqueduct Site,	Series 29 to 40,	Tables XX to XXV.
Solání Embankment Main Site,	Series 42 to 46,	„ XXVI., XXVII.
	Series 41,	„ XXVIII.

δ, "Range" of (*i.e.*, difference between the greatest and least of) the quantities in the column
v, Mean of the quantities in the column
v', Value obtained from the velocity parabola corresponding to the preceding quantity (v).
Δ, Discrepancy between the last two quantities

Explanation of the Columns

Col.	Symbol	Detail.
2	h H l	Average height of water-surface above datum Actual depth of water on the vertical of experiment. Variation of water level during the experiment. Length of Rod used for finding Rod velocity (u).
3	F_1 F_2 F_3 S	Fall of water-surface in upper part of the Reach. Fall of water-surface in middle part of the Reach Fall of water-surface in lower part of the Reach. Local Surface-Slope, (3 decimals, *i. e.*, 000, to be prefixed by reader).
4		Direction *(referred to the current-axis as N S. line)*, and *Velocity (in feet per second)* of the Wind, at beginning and end of each SET
5		Initials *of the Timekeeper*
6	v_z v_H	Velocities at surface ($z = 0$) and at every foot of depth (z = 1, 2, 3, &c.) below the surface, each entry being the mean of 3 observations at the nominal depths indicated by the length of the Connector (z). Bed velocity computed from the above.
7	D	Discharge past the vertical (in sq ft. per sec.), computed from the velocity-data of Col. 6
8	 U $v_{\frac{1}{2}H}$ u	*Three approximations to Mean Velocity past the vertical.* Quotient of Discharge — Depth, *i. e.*, ($D \div H$), from Col. 7. Mid-depth velocity computed from the data in Col. 6. Rod velocity, the mean of 6 trials.
9		Values of the differences ($v_{\frac{1}{2}H} - U$) ($u - U$) between the approx. mean velocities in Col. 8

SUBSURFACE AND MEAN VELO-

SOLÁNÍ LEFT AQUEDUCT—

[Instruments—3″ Double-Floats,

Serial No	1	2			3			4				5	SUBSURFACE past the cen [Each Velocity is the Nominal			
	Date, 1875.	DEPTH		Length of Rod.	FALL of Water-Surface.			WIND.				Timekeeper's Initial				
		Actual.	Variation.		Upper 5 miles.	Lower 4½ miles	Local Slope	From		To						
								Direction.	Velocity.	Direction.	Velocity					
		H		l	F_2	F_3	S						0	1	2	3
Series 1.	5-4-'75	0 50	·00	9	5 65	5 40	Not observed	..	0	..	0	R	4 33	4 29	4 41	4·05
	„ „	50	00	9	„	„		W	7	SW	5	W	4 10	4 22	4 41	4 32
	6-4- „	50	·00	9	5 65	5 33		..	0	..	0	R	4 26	4 12	4·05	4 29
	„ „	50	00	9	„	„		..	0	..	0	W	4 32	4 17	4 29	4 14
	„ „	50	·00	9	„	„		..	0	..	0	R	4 36	4 17	4 29	4 11
	7-4- „	·50	00	9	5 65	5·33		..	0	..	0	W	4 28	4 26	4 11	4 11
	„ „	50	00	9	„	„		..	0	..	0	R	4 19	4 00	4 17	4·00
	„ „	·50	·00	9	„	„		..	0	..	0	W	4 19	4 41	4 31	4 32
	8-4- „	·50	00	9	5 65	5 35		..	0	SW	7	R	4 30	4 22	4 11	4 22
	„ „	·50	·00	9	„	„		SW	7	SW	30	W	4 18	4 20	4 44	4 44
	9-4- „	50	·00	9	5 65	5·35		..	0	..	0	R	4 23	4·11	4 41	4 35
	„ „	·50	·00	9	„	„		..	0	..	0	W	4 33	4 38	4·03	4 20
	10-4- „	50	00	9	5 60	3 35		..	0	..	0	R	4 32	4 17	4 11	4 22
	„ „	·50	00	9	„	„		..	0	..	0	W	4 3-	4 35	4 41	4 22
	12-4- „	·40	·00	9	5 70	5 20		..	0	..	0	R	4 08	4 41	4 11	4 29
	„ „	·40	·00	9	„	„		..	0	..	0	W	4 17	4 26	4 11	4 05
	14-4- „	40	00	9	5 75	5 20		..	0	..	0	R	4 18	4 15	3 95	4 29
	„ „	·40	00	9	„	„		..	0	W	4	W	4 29	4 32	4 20	4·03
	15-4- „	·25	·00	9	5 70	5·10		..	0	..	0	R	4 28	4 05	4 35	4 17
	„ „	·25	·00	9	„	„		..	0	..	0	W	4 25	4 44	4 17	4 44
δ	Range,	·25	..	0	·15	·30	..	..	..	..	.	..	·25	·44	·49	·44
v	Means of 20	0·46	..	9	5 67	5·30	..	SW 5 W 2				..	4 25	4 21	4 22	4 21
v′		Parabolic, (v′) ..		..	..	..	..	..				..	4 25	4 25	4 23	4 18
Δ		Discrepancies, (v − v′) ..			..	..	..	..				..	00	− 01	− ·01	+ ·03

Series 2, 3, SEE

Serial No	Date, 1875.	Actual.	Variation.	Length of Rod.	Upper 5 miles.	Lower 4½ miles	Local Slope	From Direction.	From Velocity.	To Direction.	To Velocity	Timekeeper's Initial	0	1	2	3
Series 4.	18-2-'75	5·95	·00	5	5·85	2 55	Not observed	S	8	S	10	W	3 45	3 49	3 45	3 29
	„ „	93	− 05	5	5 87	2 33		S	15	S	10	R	3 45	3 49	3 45	3 49
	„ „	·90	·00	5	5·90	2·50		S	10	S	20	W	3 45	3 49	3 57	3 37
	„ „	·90	·00	5	„	„		S	15	S	10	R	3 52	3 70	3 66	3 40
δ	Range,	·05	..	0	05	05		..	..	..	.	..	·07	21	21	·20
v	Means of 4,	5·92	..	5	5·85	2 32	..	S 15				..	3·47	3 34	3·53	3·39
v′		Parabolic, (v′) ..		..	..	..	..	..				..	3 48	3 53	3·50	3 41
Δ		Discrepancies, (v − v′) ..			..	..	..	..				..	− 01	+ 01	+ 03	− ·02

CITIES PAST A VERTICAL

TABLE VII.

CENTRAL VERTICAL

and 1" wood Rods]

6								7	8			9	
VELOCITIES tral vert.cal mean of three observations]. Depths (z)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical. Various Approximations. $\frac{\text{Discharge}}{\text{Depth}}$	Mid-depth Velocity.	Rod Velocity Mean of 6 trials	DIFFERENCES	
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$
4 17	4 29	3·80	3 75	3 85	3 75	..	3 70	38·6	4 07	4 26	3 95	+ 19	− ·12
4 20	3 97	3 95	3 59	3 45	3 39	..	3 36	37 [illegible]	3 95	4 03	3 74	+ 08	− ·21
4 05	4 11	3·90	3 75	3 80	3 66	..	3 59	37 6	3 98	4 10	3 85	+ 12	− 13
4 14	3 97	4 03	3 73	3 49	3 66	..	3 75	37 7	3 97	4 01	3 75	+ 04	− 24
4·05	4 17	3 [illegible]	3 80	3 64	3 53	..	3 47	37 7	3 97	4 14	3 83	+ 17	− 14
4 03	3 80	3 95	3 77	3 73	3 35	..	3·13	37 2	3 91	3 86	3 81	− 05	− 10
4 00	4 05	3 95	4 11	3 66	3 61	..	3 58	37 7	3 97	4 04	3 92	+ 07	− 05
4 00	3 87	4 00	3 66	3 95	3 57	..	3 38	38 1	4 01	3 90	3 74	−·11	− 27
4 33	3 90	3 95	3 95	3 75	3 35	..	3 12	37	3 99	4 01	3 91	+ 02	− 00
4 32	4 05	4 00	3 75	3 90	3 51	..	3 31	38 7	4 07	4 12	3 40	+ ·05	− 6[illegible]
4 22	3 95	3 80	3 66	3 41	3 57	..	3 65	37 6	3 96	4 02	3 59	+ 06	− 37
4 00	4 03	4 14	3 87	3 73	3 64	..	3 59	38 1	4 01	4 02	3 77	+ 01	− 24
3 95	4 00	3 75	4 00	3 61	3 41	..	3 31	37 4	3 93	3 99	3 74	+ 06	− 20
4 29	4 17	3 40	3 80	3·66	3 75	..	3 80	38 6	4 07	4 20	3 68	+ 13	− 39
4 22	3 90	3 85	3 80	3 57	3 26	..	3 14	37 [illegible]	3 95	4 00	3 75	+ 05	− ·20
4 13	3 97	4 05	3 80	3 61	3 64	..	3 65	37 4	3 98	4·03	3 70	+ 05	− 26
4 29	4 22	4 00	4 00	3 85	3·80	..	3 76	38	3 97	4 24	3 8[illegible]	+ 27	− ·10
3 90	3 97	3 90	3 83	3 68	3 59	..	3 5	37 [illegible]	3 96	3 95	3 85	− 01	− 13
4 17	3 90	3 95	4 05	3 49	3 66	..	3 40	37 0	4 00	4 00	3 85	00	− ·15
4 20	3 83	3 95	3 85	3 64	3·66	..	3 67	37 [illegible]	4 04	3 97	3 8[illegible]	− 07	− 1[illegible]
·45	49	44	52	54	54	..	·65	1 7	10	40	55	38	62
4 14	4·01	3 92	3 83	3 67	3 57	..	3·51	37 8	3 99	4·04	3·77	+ ·0[illegible]	− 22
4 12	4 04	3 94	3 82	3 68	3 52	..	3 44	37 6	3 99	4 06	..	+ ·07	..
+ 02	− 03	− 02	+ 01	− 01	+ 05	..	+ 0[illegible]	0	00	− 02	..	− 02	..

NEXT PAGE

3 26	3 22	..	..	..	..	.	3 18	19 [illegible]	3 34	3 29	3 40	− 05	+ ·06
3 19	3 09	..	..	..	..	..	3 00	19 8	3 33	3 49	3 45	+ 16	+ ·17
3 12	2 97	..	..	..	..	..	2 8[illegible]	19·4	3 26	3 38	3·12	+ ·12	− 14
3·09	3·09	..	..	..	..	..	3 09	20·[illegible]	3 36	3 41	3 29	+ 05	− 0[illegible]
17	25	..	..	..	..	..	35	6	·10	20	33	21	20
3·10	3·09	..	..	..	..	..	3·0[illegible]	19 [illegible]	3·32	3·39	3·3[illegible]	+ ·07	·00
3 24	3 00	..	..	..	..	..	2 71	19 6	3 31	3 41	..	10	..
− 03	+ ·09	..	..	.	..	..	+ 3	+ [illegible]	+ 01	− 02	..	− 05	..

SUBSURFACE AND MEAN VELO-

SOLÁNI LEFT AQUEDUCT—

[*Instruments—3″ Double-Floats,*

Serial No.	Date, 1875.	2 Depth. Actual. H	Variation.	Length of Rod. l	3 Fall of Water-Surface Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind From Direction.	Velocity	To Direction	Velocity	5 Timekeeper's Initial	Subsurface past the cen- [Each Velocity is the Nominal 0	1	2	3
Series 2	27-1-'75	9 00	·00	No Rods used	5 70	4 90	Not observed	• ..	0	• ..	0	W	4 17	4 22	4 29	4 22
	" "	00	·00		"	"		..	0	..	0	R	4 29	4 22	4 35	4 22
	" "	00	00		"	"		..	0	..	0	R	4 41	4 29	4 48	4 48
	" "	00	00		"	"		..	0	SW	12	W	4 17	4 48	4 35	4 55
	" "	00	·00		"	"		SW	12	?	?	W	4 17	4 48	4 29	4 17
	" "	·00	·00		"	"		?	?	SW	11	R	4 17	4 11	4 29	4 17
	28-1- "	8 95	00		5 70	4 85		..	0	?	?	W	4 29	4 29	4 35	4 29
	" "	95	00		"	"		?	?	NE	4	R	4 41	4 55	4 41	4 22
	" "	95	00		5·75	"		NE	4	?	?	W	4 69	4 55	4 41	4 17
	" "	95	00		"	"		?	?	NE	4	R	4 48	4 41	4 35	4 29
	" "	·95	·00		"	"		NE	4	?	?	W	4 48	4 29	4 29	4·35
	" "	95	00		"	"		?	?	SE	6	R	4 48	4 22	4 55	4 48
	" "	95	00		"	"		S	3	?	?	W	4 17	4 48	4 35	4 35
	" "	97	00		"	"		?	?	..	0	R	4 29	4 17	4 29	4 05
	29 1- "	95	00		5 70	4 85		..	0	?	?	W	4 35	4 48	4 48	4 35
	" "	95	00		"	"		?	?	E	10	R	4 48	4 11	4 35	4 35
	" "	93	00		"	"		E	10	?	?	W	4 29	4 35	4 41	4 35
	" "	95	00		"	"		?	?	..	0	R	4 55	4 29	4 11	4 41
	" "	95	00		"	"		..	0	?	?	W	4 35	4 48	4 29	4 22
	" "	95	00		"	"		?	?	NE	6	R	4 11	4 29	4 35	4 55
	" "	95	00		"	"		NE	6	?	?	W	4 35	4 48	4 29	4 35
	" "	95	00		"	"		?	?	..	0	R	4 29	4 11	4 35	4 22
δ	Range,	05	..	..	05	·05	..	..	..	..	..	..	58	44	·44	50
v	Means of 22	8 96	..	..	5·71	4 86	..	* SE & E 1				..	4 31	4·33	4 35	4 31
v	Parabolic, (v)	..	..	..	..	..	..	..	..	..	..	..	4 33	4 35	4 35	4 31
Δ	Discrepancies, (v − v)	..	..	..	..	..	..	..	..	..	..	..	+ 01	− 02	00	00
Series 3.	19-2-'75	7 23	00	6	5 83	3·85	Not observed	..	0	..	0	W	3 85	3·95	4·00	3 80
	" "	23	00	6	"	"		..	0	S	6	R	3·90	3·80	3·95	3 61
	" "	23	·00	6	"	"		S	8	S	6	W	3 70	3 75	3 85	3 66
	" "	23	00	6	"	"		S	6	S	7	R	3·66	4 00	4·05	3·85
	" "	23	00	6	"	"		S	7	..	0	W	3 80	3 90	3 90	3 70
	" "	23	00	6	"	"		..	0	S	7	R	3 70	3·80	3 75	3·95
	20-2- "	23	·00	6	5 83	3·80		..	0	..	0	W	4 00	3 85	3 80	3 80
	" "	23	00	6	"	"		..	0	S	6	R	3 85	3 95	3 95	3 75
	" "	23	00	6	"	"		S	6	..	0	W	3 75	3·85	3·90	3 70
	" "	23	00	6	"	"		..	0	..	0	R	3·90	4·00	3 85	3 80
	" "	·23	·00	6	"	"		..	0	S	7	W	3 80	3 80	3 80	3 66
	" "	23	00	6	"	"		..	0	..	0	R	3 90	3·90	3·90	3 70
δ	Range,	00	..	0	00	05	..	..	..	..	..	..	·34	·25	30	34
v	Means of 12	7 23	..	6	5·83	3·83	..	S 3				..	3·82	3·88	3·89	3·74
v′	Parabolic, (v′)	..	..	..	..	..	..	..	..	..	..	..	3 84	3 86	3 84	3·77
Δ	Discrepancies, (v − v′)	..	..	..	..	..	..	..	..	..	..	..	− 02	+ 02	+ 05	− ·02

CITIES PAST A VERTICAL. TABLE VIII.

CENTRAL VERTICAL.

and 1" wood Rods].

6								7	8			9	
VELOCITIES tral vertical. mean of three observations). Depths (z).							Rod velocity.	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations			DIFFERENCES	
									Discharge / Depth	Mid depth Velocity.	Rod Velocity Mean of 8 trials		
4	5	6	7	8	9	10	v_R	D	U	v_m	u	$(v_m - U)$.	$(u - U)$.
4·17	4·11	4·05	3·90	3·75	..	..	3·60	36·6	4·07	4·14	Not observed.	+·07	..
4·11	4·11	4·05	4·05	3·95	..	..	3·85	37·1	4·12	4·11		−·01	..
4·41	3·95	4·11	3·85	3·66	..	..	3·47	36·6	4·06	4·18		+·12	..
4·23	4·11	4·05	3·70	3·66	..	..	3·62	37·9	3·99	4·16		+·17	..
4·22	4·05	3·90	3·85	3·61	..	..	3·37	36·9	4·10	4·13		+·03	..
4·35	3·90	3·90	3·77	3·70	..	..	3·63	37·2	4·13	4·12		−·01	..
4·05	4·22	4·17	3·80	3·61	..	..	3·43	36·5	4·08	4·13		+·05	..
4·35	4·11	4·17	3·75	3·75	..	..	3·75	37·1	4·14	4·23		+·09	..
4·29	4·17	4·11	3·90	3·75	..	..	3·61	37·2	4·16	4·23		+·07	..
4·29	4·17	4·00	3·90	3·80	..	..	3·70	37·1	4·15	4·23		+·08	..
4·23	4·05	4·05	3·95	3·70	..	..	3·46	36·7	4·10	4·14		+·04	..
4·35	4·35	4·17	3·85	3·66	..	..	3·48	37·4	4·17	4·35		+·18	..
4·23	4·35	4·11	3·90	3·66	..	..	3·43	37·2	4·16	4·28		+·12	..
4·23	4·25	4·17	3·85	3·61	..	..	3·38	36·3	4·04	4·23		+·10	..
4·29	4·17	4·05	3·85	3·75	..	..	3·65	37·3	4·16	4·23		+·07	..
4·48	4·22	4·05	3·90	3·80	..	..	3·70	37·0	4·14	4·36		+·22	..
4·29	4·11	3·95	3·85	3·57	..	..	3·30	36·3	4·08	4·20		+·12	..
4·29	4·17	3·95	3·75	3·66	..	..	3·57	36·0	4·09	4·23		+·14	..
4·11	4·29	4·17	4·05	3·75	..	..	3·46	37·2	4·16	4·20		+·04	..
4·17	4·05	4·22	3·80	3·80	..	..	3·80	37·0	4·13	4·11		−·02	..
4·41	4·29	3·85	4·05	3·85	..	..	3·66	37·0	4·20	4·35		+·15	..
4·23	4·11	4·08	3·66	3·66	..	..	3·66	36·0	4·03	4·17		+·14	..
·43	·45	·37	·39	·38	..	..	·55	1·1	·21	·23	..	·24	..
4·26	4·15	4·06	3·86	3·71	..	..	3·57	36·9	4·11	4·21	..	+ ·10	..
4·25	4·16	4·04	3·89	3·71	..	..	3·52	36·8	4·11	4·21	..	+·10	..
+·01	−·01	+·02	−·03	·00	..	..	+·05	+·1	·00	·00	..	·00	..
3·61	3·37	3·40	Not observed.	..	..	..	3·44	26·0	3·66	3·68	3·57	+·02	−·09
3·66	3·45	3·49		..	..	..	3·54	26·	3·62	3·64	3·45	+·02	−·17
3·53	3·33	3·26		..	..	..	3·17	25·5	3·52	3·58	3·45	+·06	−·07
3·53	3·29	3·33		..	..	..	3·38	26·4	3·65	3·65	3·66	·00	+·01
3·61	3·40	3·19		..	..	..	2·9	25·6	3·56	3·64	3·6	+·08	+·07
3·53	3·61	3·33		..	..	..	2·98	26·5	3·65	3·61	3·70	−·04	+·05
3·57	3·66	3·45		..	..	..	3·19	26·7	3·68	3·66	3·50	−·02	−·18
3·57	3·33	3·37		..	..	..	3·3	26·4	3·64	3·64	3·63	·00	−·01
3·85	3·57	3·49		..	..	..	3·30	26·0	3·67	3·79	3·77	+·12	+·10
3·66	3·66	3·49		..	..	..	3·28	27·0	3·73	3·71	3·38	−·02	−·35
3·49	3·33	3·45		..	..	..	3·60	26·1	3·59	3·55	3·57	−·04	−·02
3·61	3·66	3·33		..	..	..	3·01	26·4	3·64	3·64	3·45	·00	−·11
·36	·37	·30	..	..	..	..	·63	1·3	·21	·24	·39	·16	·45
3·60	3·17	3·34	..	..	..	..	3·27	26·4	3·63	3·63	3·56	+·02	−·07
3·66	3·42	3·28	..	..	..	..	2·95	28·1	3·60	3·71	..	+·11	..
−·06	−·02	+·10	..	..	..	..	+·32	+·3	+·03	−·08	..	−·09	..

* Wind observed only at beginning and end of alternate Sets in this Series.

SUBSURFACE AND MEAN VELO-

Soláni Right Aqueduct—

[*Instruments—1⅞" Double-Floats,*

Serial No.	1	2			3			4				5				
	Date, 1876 77 78.	Depth.		Length of Rod.	Fall of Water Surface			Wind.				Timekeeper's Initials.	Subsurface- past the cen (Each Velocity is the Nominal			
		Actual.	Variation.		Upper 5 miles	Lower 4½ miles.	Local Slope.	From Direction.	Velocity.	To Direction.	Velocity.					
		H		l	F_1	F_2	S						0	1	2	3
Series 5.	18-8-'77	9·97	+ ·02	9½	5·98	5·50	?	NE	3	SW	1	P	4·76	4·55	4·85	4·69
	" "	·99	+ ·02	9½	5·96	5·52	?	SW	1	SW	1	W	4·69	4·65	4·72	4·76
	17-8- "	·97	+ ·03	9½	5·98	5·50	?	W	4	ENE	5	P	4·88	4·48	4·76	4·76
	" "	·95	·00	9½	5·97	5·51	?	ENE	5	NNE	7	W	4·58	4·76	4·84	4·65
	17-6-'78	·97	+ ·03	9½	5·98	5·52	204	W	4	..	0	P	4·35	4·61	4·76	4·69
	19-6- "	·96	·00	9½	5·99	5·51	195	N	9	..	0	R	4·20	4·76	4·65	4·69
	25-6- "	·95	+ ·02	9½	6·00	5·45	200	S	1	W	8	R	4·69	4·61	4·76	4·76
	" "	·97	+ ·02	9	5·98	5·47	"	W	6	S	1	P	4·65	4·61	4·69	4·92
	1-7- "	·96	·00	9	5·99	5·41	203	E	4	..	0	P	4·61	4·44	4·72	4·72
	" "	"	·00	9	"	"	"	..	0	E	13	R	4·05	4·84	4·61	4·72
	22-6- "	·95	·00	9	6·00	5·50	20	S	4	S	12	P	4·48	4·84	4·92	4·92
	27-6- "	·95	+ ·01	9	6·00	5·43	207	W	1	SSE	8	R	4·84	4·69	4·80	4·76
	4-7- "	·92	·00	9½	6·03	5·35	205	NE	7	NE	12	P	4·08	4·72	4·55	4·92
	16-8-'77	·87	− ·01	9	5·95	5·40	?	NE	4	ENE	5	P	4·76	4·72	5·24	5·00
	" "	·86	− ·01	9½	5·94	5·39	?	ENE	5	ENE	6	W	4·80	4·76	4·72	4·76
	15-8- "	·77	− ·06	9½	5·93	5·37	?	NNE	8	..	0	W	4·80	4·72	4·69	4·38
δ	Range,	·22	..	0	10	17	?	..	..	..	..	..	·33	·40	·49	·42
v	Means of 16	9·94	..	9·3	5·98	5·45	?	NE & E 2				..	4·58	4·67	4·75	4·77
v'		Parabolic, (v)	..	..	..	..	..	..	..	..	..	..	4·61	4·67	4·71	4·72
Δ		Discrepancies, (v − v)	..	..	..	..	..	..	..	—	..	..	− ·03	·00	+ ·04	+ ·05
Series 6.	28-4-'77	9·48	·00	9	5·52	5·28	17	..	0	N	6	P	4·20	4·55	4·44	4·51
	" "	·45	·00	9	"	"	"	N	8	N	11	W	4·72	4·41	4·17	4·44
	30-4- "	·48	·00	9	5·52	5·28	?	N	6	N		P	4·11	4·48	4·29	4·32
	" "	·45	·00	9	"	"	?	N	8	N	1	W	4·48	4·35	4·35	4·59
	" "	·48	·00	9	"	"	?	S	5	N	2	P	3·95	4·22	4·51	4·44
	30-5-'76	·4	·00	9	5·50	5·35	?	E	9	NE	10	W	4·51	4·38	4·55	4·26
	" "	·45	·00	9	"	"	?	NE	12	E	20	R	4·48	4·32	4·41	4·51
	5-5- "	·41	+ ·02	9	5·91	5·31	?	SE	11	NE	10	W	4·35	4·55	4·38	4·32
	" "	·44	·00	9	5·90	5·33	?	NE	6	E	1	R	4·00	4·41	4·38	4·17
	10-5- "	·45	·00	9	5·82	5·33	?	..	0	..	0	W	4·26	4·35	4·35	4·41
	" "	·43	·00	9	"	"	?	..	0	NE	1	R	4·38	4·44	4·26	4·20
	5-5-'78	·35	·00	8	5·87	5·04	158	W	1	W	1	R	4·00	4·58	4·41	4·35
	7-5- "	·33	·00	9	5·87	5·06	150	..	0	S	0	R	3·85	4·20	4·35	4·55
	" "	·35	− ·03	9	5·88	5·03	"	S	5	..	0	P	4·20	4·32	4·48	4·48
	8-5- "	·37	·00	8	5·83	5·02	155	..	0	S	5	R	4·22	4·17	4·32	4·41
	" "	·37	·00	8½	"	"	"	S	8	..	0	P	4·00	4·20	4·38	4·41
δ	Range,	·21	..	1	·10	·33	?	..	..	..	.	.	·57	·33	·38	·41
v	Means of 16	9·41	..	8·9	5·81	5·23	?	NE & E 4				..	4·23	4·36	4·38	4·40
v		Parabolic, (v)	..	..	..	..	..	..	..	..	..	..	4·23	4·33	4·36	4·37

CITIES PAST A VERTICAL **TABLE IX**

CENTRAL VERTICAL

and 1" tin Tube Rods]

6								7	8			9	
VELOCITIES tral vertical mean of three observations]							Rod velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vert at Various Approximations			DIFFERENCE.	
Depths (z)									Discharge / Depth	Mid-depth Velocity	Rod Velocity means of trials	$(v_{\frac{1}{2}R} - U)$	$(u - U)$
4	5	6	7	8	9	10	v_R	D	U	$v_{\frac{1}{2}R}$	u		
4 65	4 65	4 69	4 35	4 55	4 41	4 48	4 48	40 6	4 57	4 65	4 36	+ 08	− 21
4 6	4 80	4 65	4 5	4 55	4 55	4 26	4 26	46 4	4 65	4 80	4 5	+ 15	− 29
4 80	4 2	4 84	4 61	4 65	4 48	4 55	4 55	46 4	4 66	4 72	4 26	+ 06	− 41
4 69	4 80	4 55	4 51	4 65	4 44	4 41	4 41	46	4 64	4 80	4 49	+ 16	− 15
4 2	4 48	4 61	4 44	4 61	4 48	4 38	4 38	45	4 56	4 48	4 15	− 08	− 41
4 84	4 61	4 69	4 2	4 44	4 51	4 38	4 33	46 1	4 63	4 61	4 58	− 02	− 25
4 61	4 72	4 80	4 51	4 58	4 51	4·29	4 29	46 1	4 63	4 72	4 4	+ 09	− 15
4 51	4 48	4 6	4 61	4 38	4 55	4 55	4 55	46 1	4 62	4 48	4 1	− 14	− 45
4 65	4 48	4 38	4 44	4 35	4 32	4 55	4 55	44 8	4 59	4 48	4 26	− 02	− 24
4 6	4 51	4 6	4 69	4 55	4 55	4 6	4 61	46	4 64	4 51	4 21	− 13	− 45
4 48	4 33	4 51	4 72	4 38	4 32	4 1	4 1	45 8	4 60	4 38	4 32	− 22	− 25
4 65	4 55	4 51	4 48	4 51	4 55	4 29	4 29	45 8	4 61	4 55	4 48	− 06	− 1
4 69	4 80	4 84	4 65	4 51	4 58	4 65	4 65	46 6	4 69	4 80	4 15	+ 11	− 54
4 72	4 58	4 48	4 55	4 38	4 29	4 61	4 61	46 6	4 64	4 59	4 12	− 05	− 5
4 84	4 2	4 58	4 38	4 22	4 26	4 29	4 29	45 1	4 58	4 73	4 36	+ 15	− 2
4·69	4 55	4 6	4 55	4 38	4 38	4 22	4 22	45 4	4 60	4 57	4 36	− 03	− 24
36	42	46	37	43	32	48	48	1	19	42	3	38	41
4 60	4 61	4 64	4 55	4 48	4 45	4 49	4 4	45 8	4 61	4 60	4 31	+ 01	− 30
4 72	4·69	4 64	4·56	4 47	4 35	4 22	4 2	45	4 60	4 69	.	+ 09	..
− 03	− 03	00	− 01	+ 01	+ 10	+ 20	+ 20	+ 1	+ 01	− 0		− 03	..
4 32	4 38	4 26	4 29	4 03	4 17	.	4 24	41 6	4 32	4 36	3 86	+ 04	− 46
4 55	4 14	4 35	4 05	4 00	4 14		4 2	40 4	4 26	4 25	4 10	− 01	− 06
4 32	4 08	3 90	4 20	3 90	4 05		4 12	40 4	4 21	4 36	4 10	+ 15	− 11
4 26	4 1	4 26	4 14	4 08	4 05		4 04	40	4 25	4 19	3 92	− 06	− 3
4 32	4 20	4 29	4 22	4 29	4 22		4 2	40 1	4 28	4 23	4 1	− 05	− 11
4 38	4 32	4 20	4 14	4 22	4 14	..	4 20	40	4 30	4 34	4 12	+ 04	− 18
4 51	4 44	4 22	4 2	4·08	4 35	.	4 4	41	4 5	4 46	4 1	+ 11	− 18
4 32	4 29	4 35	4 11	4 38	4 17	.	4 08	40 6	4 32	4 30	4 20	− 02	− 1
4 35	4 44	4 22	4 17	4 05	4 21	..	4 30	40	4 2	4 4	4 24	+ 15	− 00
4 22	4 14	4 08	3 97	3 87	4 14	.	4 20	39 4	4 1	4 16	3 9	−·01	− 20
4 26	4 14	4 35	4 6	3 95	4·03	..	4·0	39·8	4 22	4 1	4 05	−·05	− 15
4 43	4 44	4 1	4 22	4 22	4 35	..	4 3	40·4	4 33	4 45	4 22	+ 12	− 21
4 55	4 29	4 26	4 26	4 1	4 14	.	4 17	40·0	4 29	4 35	4 1	+ 09	− 18
4 35	4 58	4 38	4 08	4 1	4 17	..	4 1	40	4 33	4 50	3 8	+ 17	− 40
4 20	4 35	4 14	4 05	4 00	3 9	.	3 91	38	4 29	4 32	3 9	+ 13	− 20
4 58	4 17	4 44	4 11	4 11	4 03		4 04	39	4 24	4 25	4 33	+ 01	+ 09
33	44	54	32	51	38		51	2	18	34	4	23	55
4·30	4·30	4 24	4 16	4 10	4 1	..	4·1	40·7	4 2	4·32	4·0	+·0	− 1
4 30	4 33	4 25	4 20	4 10	3 95		3 9	40 1	4 0	4 34		+ ·05	
00	− 03	− 04	− 04	00	+ 17		+ 25	+ 1	+ 01	− 0		− 03	

SUBSURFACE AND MEAN VELO-

Solânî Right Aqueduct—

[*Instruments*—1⅜" *Double-Floats,*

	1	2			3			4				5	Subsurface- past the cen- [Each Velocity is the Nominal			
		Depth			Fall, of Water-Surface.			Wind.								
								From		To						
Serial No.	Date, 1876.	Actual	Variation	Length of Rod.	Upper 5 miles.	Lower 4½ miles.	Local Slope.	Direction.	Velocity	Direction.	Velocity.	Timekeeper's Initial.				
		H		l	F_1	F_2	S						0	1	2	3
Series 7.	23-3-76	8·95	·00	8	5·80	4·95	19	NE	6	..	0	W	4·17	4·10	4·35	4·22
	13-3- "	·90	·00	8	5·80	4·85	?	S	5	S by W	10	H	4·51	3·77	4·20	4·29
	" "	·90	·00	8	"	"	?	S by W	10	S by W	10	W	4·00	4·10	4·26	4·03
	15-3- "	·85	·00	8	5·75	4·85	?	SW	8	W	0	W	4·08	4·22	4·12	4·14
	" "	·85	·00	8	"	"	?	W	6	S by W	10	H	4·38	4·05	4·08	4·03
	" "	·85	·00	8	"	"	?	S by W	10	S	11	W	3·95	4·08	4·05	4·11
	" "	·85	·00	8	5·80	"	?	S	11	S	.	H	3·50	4·17	4·20	4·35
	" "	·85	·00	8	"	"	?	S	5	S	5	W	4·05	4·17	4·20	3·97
	" "	·85	·00	8	"	"	?	S	9	SSW	15	H	3·64	4·11	4·00	4·06
	16-3- "	·85	·00	8	5·75	4·85	?	..	0	..	0	W	4·08	4·00	4·08	4·11
	" "	·85	·00	8	"	"	?	..	0	..	0	H	4·22	3·90	4·08	4·04
	" "	·85	·00	8	"	"	?	S	4	S	6	W	4·11	4·05	4·05	4·03
	" "	·85	·00	8	"	"	?	S	6	S	1	H	4·19	4·29	4·13	4·03
	14-3- "	·80	·00	8	5·80	4·80	?	N	5	..	0	H	4·00	4·26	4·03	4·17
	" "	·80	·00	8	"	"	?	..	0	..	0	W	4·17	4·22	4·35	4·35
	" "	·85	·00	8	5·85	4·85	?	S	5	S	13	H	3·95	4·11	4·10	4·26
	18-3- "	·80	·00	8	5·80	4·90	?	..	20	..	2	W	3·97	4·00	4·08	4·05
	" "	·80	·00	8	"	"	?	S	14	..	0	H	3·85	3·77	4·08	4·11
δ	Range,	·15	..	0	·10	·15	?	..	..	..	..	..	·87	·52	·35	·41
v	Means of 18,	8·83	..	8	5·80	4·86	?	S by W 5				..	4·07	4·09	4·15	4·14
v'		Parabolic, (v')	..	..	..	..	..	..	..	..		..	4·07	4·11	4·13	4·12
Δ		Discrepancies, (v − v')	..	..	..	..	..	..	..	..		..	·00	−·02	+·02	+·01
Series 8.	23-4-76	8·53	·00	8	5·87	4·33	20	..	0	..	0	H	4·03	4·08	4·05	4·03
	" "	·53	·00	8	"	"	"	..	0	..	0	W	4·17	4·11	4·14	4·08
	" "	·53	·00	8	"	"	"	..	0	..	0	H	4·03	3·97	4·10	4·14
	" "	·53	·00	8	"	"	"	..	0	..	0	W	4·05	4·22	4·08	4·14
	" "	·53	·00	8	"	"	"	..	0	..	0	H	3·91	4·11	4·16	4·17
	" "	·53	·00	8	"	"	"	..	0	..	0	W	4·00	4·29	4·14	3·97
	21-4- "	·45	·00	8	5·85	4·65	20	..	0	..	0	H	3·87	4·05	4·05	4·05
	" "	·45	·00	8	"	"	"	..	0	N by E	11	W	4·08	4·11	4·11	4·17
	" "	·45	·00	8	"	"	"	N by E	11	NE	10	H	4·05	4·11	4·11	3·77
	" "	·45	·00	8	"	"	"	NE	10	NE	14	W	3·97	4·11	3·90	4·00
	19-4- "	·30	·00	8	5·50	4·30	20	..	0	..	0	H	4·00	3·90	4·05	4·05
	" "	·30	·00	8	"	"	"	..	0	..	0	W	3·92	4·17	4·19	3·90
	20-4- "	·30	·00	8	5·50	4·50	20	..	0	..	0	H	4·00	4·16	4·08	4·19
	" "	·30	·00	8	"	"	"	..	0	..	0	W	4·00	4·08	4·11	4·03
	" "	·30	·00	8	"	"	"	..	0	NNE	[illegible]	H	4·05	4·14	3·92	4·03
	" "	·30	·00	8	"	"	"	NNE	5	N	4	W	4·29	4·31	3·95	4·20
δ	Range,	·23	..	0	·03	·33	00	..	..	..	..	..	·42	·42	·39	·52
v	Means of 16,	8·42	..	8	5·62	4·62	20	NE by N 2				..	4·03	4·13	4·07	4·07
v'		Parabolic, (v')	..	..	..	..	..	..	..	..		..	4·06	4·09	4·10	4·05
Δ		Discrepancies, (v − v')	..	..	..	..	..	..	..	..		..	−·03	+·04	−·01	−·03

CITIES PAST A VERTICAL

TABLE X

CENTRAL VERTICAL

and 1″ tin Tube-Rods]

6								7	8			9	
VELOCITIES tral vertical mean of three observations).							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical.			DIFFERENCE*	
Depths (z)									Various Approximations				
									Discharge Depth	Mid-depth Velocity	Rod Velocity Mean of a triple		
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}D}$	u	$(v_{\frac{1}{2}D} - U)$	$(u - U)$
4 38	4·05	4 12	3 80	3 73	..	..	3 66	36 5	4 07	4 22	4 00	+ 15	− 07
4 17	4 05	3 95	3 77	3 82	..	.	3 66	35 6	4 02	4 12	3 91	+ 10	− 11
4 17	4 08	4 05	3 85	3 87	..	..	3 89	36 0	4 04	4 13	3 96	+ 09	− 05
4 17	4 05	4 08	3 97	3 73	..	..	3 53	35 [illegible]	4 05	4 12	3 93	+ 07	− 12
4 05	3 95	3·95	3 92	3 75	..	..	3 6	35 9	3 97	4 01	3 7	+ 04	− 21
4 20	4 03	3 82	3 75	3 61	.	..	3 49	34 9	3 94	4 13	3 9	+ 19	− 15
4 35	4 20	3 82	3 87	3 90	..	..	3·93	36 [illegible]	4 21	4 29	3 82	+ 18	− 29
4 00	4 11	3 85	3 90	3 77	..	..	3 61	35 3	3 90	4 05	3 6	+ 06	− 23
3 95	4 08	3 95	3 85	3 0	.	.	3 5	35 2	3 98	4 01	3 84	+ 03	−·10
4 05	3 85	4 05	3 70	3 68	.	..	3 60	34 7	3 92	3 96	3 86	+ 04	− 06
4 11	3 82	3 85	4 05	3 77	..	..	3·53	34 9	3 94	3 99	3 76	+ 05	− 16
3 95	3 85	3 85	3 82	3 70	..	..	3 60	34 6	3 91	3 91	3 8	00	− 04
4 05	4 11	4 03	3·90	3 32	.	..	3 74	35 9	4 05	4 08	3 80	+ 03	− 25
4 03	3 92	4 14	3 85	3 68	..	..	3 54	35 2	4 00	3 99	3 85	− 01	− 19
4 20	3 90	3 92	3 90	3 85	..	..	3 8	35 9	4·08	4 06	3·93	00	− 15
3·95	4 22	4 00	4 03	3 75	..	..	3 51	35 [illegible]	4 06	4 07	3 84	+ 01	− 21
4 11	4 11	4 00	3 73	3 66	..	..	3 60	34 6	3·95	4 11	3 8	+ 18	− 05
3 97	3 92	3 92	3 85	3 59	..	..	3 38	34 1	3·88	3 95	3 75	+ 07	− 13
43	40	32	35	31	..	..	55	2 4	23	38	29	20	25
4 10	4 02	3 90	3 87	3 74	..	..	3·6	35 4	4·00	4 07	3·85	+ 07	− 15
4 10	4 04	3 96	3 86	3 73	..	..	3 60	35 4	4 00	4 08	..	08	..
00	− 02	00	+ 01	+ 01	.	..	+ 03	0	00	− 01	..	− 01	..
3 90	3 87	3 85	3 82	3 66	..	..	3 58	33·4	3 92	3 89	3 81	− 03	−·11
4 08	3 90	3 75	3 47	3 82	..	..	4·01	33	3 92	4 03	3 71	+ 11	− 21
4 29	3 85	3 82	3 92	3 68	..	..	3 55	33 4	3 97	4 17	3 73	+ 20	− 24
4 22	3 92	4 08	3 7	3 75	..	..	3 74	34 9	4 01	4 14	3 6	+ 13	− 25
4 03	4 11	3 95	3 97	3 85	..	..	3 39	34 6	4·0	4·05	3 70	00	− 35
4 08	4 00	3 87	3 75	3 75	..	..	3 7	34 [illegible]	3 98	4 06	3·82	+ 08	− 16
3 82	3 90	3 91	3 77	3 95	..	..	4 0	33·4	3 95	3 84	3·86	− 11	− 09
4 08	3 87	3 55	3 57	3 73	..	..	3 80	33 1	3 92	4 03	3 71	+ 11	− 21
4 00	4 11	3·97	3 75	3 53	.	..	3 4	33 1	3 92	4 03	3 71	+ 11	− 21
3 92	4 00	3 82	3 73	3 75	..	..	3 6	33 1	3·92	3 94	3 9	+ 02	·00
4·03	3 9	3 87	3 0	3 64	.	..	3 62	32 4	3·91	4·02	3 71	+ 11	− 20
3 80	3·85	3 49	3 64	3 4	..	..	3 42	32·[illegible]	3 85	3 81	3 8	− 04	− 0
4 26	3 95	3 68	3 75	3 70	..	..	3 68	33 4	4·02	4 21	3 85	+ 19	− 1
4 11	4 03	3 85	3 80	3 77	..	..	3 74	33·[illegible]	3·98	4 10	3 79	+ 12	− 16
3 97	4 03	4·03	3 73	3·64	..	..	3 61	32·6	3·96	3·98	3 9	+ 02	− 1
4 03	3 95	3 70	3 68	3 51	.	..	3 40	33·[illegible]	3 97	4·02	3·70	+ ·05	− 2
49	26	59	50	45	..	..	61	2 [illegible]	70	40	2	31	3
4·04	3·96	3 83	3·74	3 70	..	..	3·6	33·[illegible]	3 95	4·0	3·7	+ ·07	− 1
4 03	3 96	3 57	3 75	3 61	.	..	3 31	33	3 93	4·02	..	+ ·07	..
+ 01	00	− 04	− 01	+ 09	..	..	+ 1	[illegible]	00	00	..	00	..

SOLÁNI RIGHT AQUEDUCT—

[*Instruments—1⅝″ Double-Floats,*

	1	2			3			4				5				
		DEPTH.			FALL of Water-Surface			WIND.					SUBSURFACE- past the cen- [Each Velocity is the Nominal			
								From		To						
Serial No	Date, 1875—79	Actual.	Variation.	Length of Rod.	Upper 5 miles	Lower 4½ miles	Local Slope	Direction.	Velocity.	Direction.	Velocity	Timekeeper's Initial.				
		H		*l*	F_1	F_2	S						0	1	2	3
Series 9.	22 10-'75	8 21	− 02	7′	6 51	4 11	17	NNW	4	..	0	R	4 80	4 80	4 69	4 84
	5-4-'7	28	00	7½	5 82	4 11	20	..	0	..	0	C	4 17	4 41	4 17	4 35
	30 6-'76	30	00	8	5 90	4 60	?	..	0	..	0	R	4 29	4 08	4·05	4 14
	" "	30	00	8	"	"	?	..	0	..	0	W	4 22	4 14	4 14	4 32
	" "	·30	00	8	"	"	?	..	0	..	0	H	4 17	4·26	4 22	4 35
	" "	30	00	8	"	"	?	..	0	SW	0	W	4 22	4 20	4 26	3 97
	11-7- "	27	00	8	5 95	4 57	?	..	0	..	0	R	4 20	4 41	4 55	4 41
	" "	29	+ 03	8	5 96	4 59	?	..	0	S	5	W	4 32	4 41	4 38	4 38
	" "	32	+ 04	8	5 93	4 62	?	S	5	S	4	H	4 20	4 35	4 48	4 36
	" "	36	+ 01	8	5 89	4 66	?	S	4	S	[illegible]	W	4 14	4 38	4 38	4 51
	" "	·39	+ 01	8	5 86	4 69	?	S	9	S	[illegible]	H	3 82	4 41	4 41	4 58
	" "	40	+ 01	8	5 85	4 70	?	S	5	S	4	W	4 41	4 58	4 39	4 48
	" "	42	+ 03	8	5 83	4 72	?	S	4	..	0	H	4 35	4 51	4 41	4 61
	23-10-'75	40	00	8	6 00	4 30	140	SW	1	..	0	F	4 44	4·69	4 65	4 72
δ	Range,	21	..	·5	69	61	?	..	..	..	..	..	·95	·72	·64	87
v	Means of 14,	8 32	..	7 9	5 98	4 33	?	S b W 3				..	4 28	4 40	4 37	4 42
v′		Parabolic, (v′)	..	..	..	..		..	..	..		..	4 31	4 36	4 35	4 37
Δ		Discrepancies, (v − v′)	..		..	..		..	..	..		..	− 03	+ 04	− 01	+ 05
Series 10	17-7-'70	8 16	− 02	7	5 99	4 46	Not observed	..	0	..	0	W	4 55	4 58	4 38	4 41
	" "	·10	− 10	7	6·05	4 40		..	0	SE	4	H	4 38	4 76	4 35	4 35
δ	Range,	06	..	0	·06	06		..	..	..	..	..	·17	18	·03	·06
v	Means of 2,	8 13	..	7	6 02	4 43		SE 1				..	4 47	4 67	4 37	4 38
Series 11.	20 6-'76	7 80	·00	7	5 90	4 25	?	SSW	6	W b N	4	W	3 85	4 00	4·03	4·05
	" "	·80	·00	7	"	"	?	W b N	4	..	0	H	3 87	3 97	4 11	3 95
	" "	80	·00	7	"	"	?	..	0	..	0	W	4 17	4 11	3·97	4 11
	" "	80	·00	7	"	"	?	..	0	..	0	H	4 08	3 70	4·05	4 11
	" "	80	00	7	"	"	?	..	0	W	0	W	4 05	3 87	4 17	4·03
	" "	·80	·00	7	"	"	?	W	6	W	11	H	4·05	4 14	3 87	4 20
	" "	·80	·00	7	"	"	?	W	11	W	10	W	3 87	4 29	4·03	4 26
	27-6- "	·79	− 02	7	5·81	4 29	210	..	0	..	0	W	3 95	4 27	4 14	4 17
	" "	·77	− 02	7	5·83	4 27	"	..	0	..	0	H	4 20	4 32	4 14	4 32
	" "	76	·00	7	5·84	4 26	"	..	0	..	0	W	4 17	4 20	4 00	4·05
	28-6- "	·65	·00	7	5 82	4 16	21	..	0	..	0	H	4 22	4 29	4 08	4 14
	" "	·64	·00	7	"	"	"	..	0	..	0	W	4 14	4 33	4 11	4·22
	" "	·63	− 03	7	5·83	4 17	"	..	0	..	0	H	4·08	4 05	4 17	4 26
	" "	[illegible]	·00	7	5 85	4 15	"	..	0	..	0	W	4·05	4·03	4·03	4·05
	" "	64	−·03	7	5 86	4 14	"	..	0	..	0	R	3·95	4 05	4·03	4 17
δ	Range,	·16	..	0	·07	·15	?	..	..	..	..	..	·37	·42	·30	·37
v	Means of 15	7 73	..	7	5 86	4 23	?	W 2				.	4·03	4 10	4 07	4 14
v′		Parabolic, (v′)	..		.			..	..	..		..	4 03	4 10	4 11	4 10
Δ		Discrepancies (v − v′)	..		.			..	..	..		..	00	00	− 04	+ 04

TABLE XI

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1" tin Tube-Rods]

6								7	8			9	
VELOCITIES tral vert cal. mean of three observations] Depths (a)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations. Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 4 trials	DIFFERENCES $(v_m - U)$	$(u - U)$
4	5	6	7	8	9	10	v_B	D	U	v_m	u		
4 65	4 ,6	4 61	4 69	4 55	..	..	4 52	38	4 73	4 66	4 44	− 07	− 29
4 17	4 03	3 8,	3 75	3 75	..	...	3 7	33	4 10	4 15	4 01	+ 05	− 09
4 11	3 93	3 85	4 17	3 ,0	..	..	3 56	33 (	4 04	4 09	3 96	+ 05	− 05
4 26	4 1,	4 11	3 80	3 85	..	..	3 8	34 1	4 11	4 25	3 76	+ 14	− 45
3·80	3 95	4 00	3 90	3 90	..	..	3 90	33 8	4 07	3 82	3 95	− 25	− 1
4 03	4 03	4 83	3 73	3 68	..	..	3 66	33 1	3 98	4 03	3 83	+ 05	−·15
4 14	4 22	4 14	4 08	4 00	..	..	3 98	33	4 25	4 15	3 77	− 10	− 48
4 20	4 22	4 20	3 97	3 95	..	..	3 94	33 1	4 23	4 20	3 92	− 03	− 31
4 35	4 23	4 29	3 97	3 93	..	..	3 94	33 1	4 22	4 33	3 93	+ 11	− 29
4 20	4 26	4 14	4 00	3 87	..	..	3 8	33 4	4 24	4 21	4 05	− 03	− 19
4 35	4 41	4 14	3 95	4·00	..	..	4·01	33	4·28	4 36	3 96	+ 08	−·3
4 41	4 32	4 26	3 95	4 11	..	..	4 1,	36	4 32	4 39	4 00	+ 07	− 32
4 22	4 14	4 38	3 95	4 29	..	..	4 43	36 4	4 32	4 20	4 11	−·12	− 21
4 61	4 72	4 61	4 43	4 26	..	..	4 1,	38 7	4 60	4 63	4·0,	+ 03	− 33
85	81	93	06	87	..	..	·96	3	75	84	76	30	45
4·2	4 24	4 2	4 03	3·99	..	..	3 98	33 4	4 32	4 25	3 99	− 07	− 34
4 33	4 27	4 10	4 07	3 93	.	..	3 88	33 4	4 23	4 33	..	+ 08	..
− 06	− 03	+ 06	− 04	+ 06	..	.	+ 10	(	+ 07	− 08	..	− 15	..
4 55	4 55	4 38	4 35	4 25	..	..	4 23	36	4 45	4 55	4 05	+ 10	−·40
4 48	4 35	4 20	4 22	3 90	..	..	3 8	33 4	4 3,	4 47	4 01	+ 10	− 30
07	20	18	13	35	..	..	36	9	03	08	04	00	04
4 52	4 45	4 20	4 29	4 08	..	..	4 0	33	4 41	4 51	4 03	+ 10	− 3
4 00	3 68	3 84	3 73	..	..	..	3 73	30 3	3 88	4 00	3 6	+ 12	− 21
3 85	3 85	3 92	3 82	..	..	..	3 74	30	3 91	3 86	3 69	− 05	− 2
4 14	3 87	3 80	3 61	..	..	..	3 46	30	3 94	4 14	3 7	+ 20	− 21
4 00	4 00	3 87	3 70	..	..	..	3 56	30	3 94	4 01	3 8	+ 07	− 11
4 0	3 92	3 64	3 83	..	..	..	3 95	31 0	3 92	4 03	3 85	+ 11	− 04
4 00	3 90	3 80	3 5	..	..	..	3 71	31 1	3 91	4 01	3	+ 03	− 2
4 03	3 87	3 75	3 66	..	..	..	3 59	31	4 00	4 0	3·8	+ 05	− 1
4 00	4 05	3 17	3 70	..	..	..	3 4	31	4 04	4·02	3·80	− 02	− 24
4 17	3 95	4 00	3 77	..	..	..	3 59	31 7	4·08	4 19	3 80	+ 11	− 2
4 14	4 11	3 70	3 66	..	..	..	3 55	31 1	4·00	4 13	3 8	+ 13	− 1
3 92	4 44	3 61	3 80	.	.	..	3 9	31	4 32	3 96	3	− 16	− 3
4 14	4 14	4·00	3 80	..	..	..	3 66	31	4·08	4 15	3·9	+·07	− 1
3 97	3 92	3	3 70	..	..	..	3 6,	30·0	4 00	4·02	3 6	+ 02	− 3
4 22	3 95	3 80	3 77	..	..	..	3 78	30	3 96	4 19	3	+ 23	− 1
4 14	4·00	3 80	3 55	..	..	..	3 6	30	4·02	4 15	3 80	+ 13	− 16
37	76	39	·24	..	..	..	39	1 4	24	33	24	39	·36
4 0	3 99	3 92	3·74	..	..	..	3·6	30	3 99	4·06	3·7	+·07	− 3
4 03	3 97	3 86	3 72	..	..	..	3 3	30·4	3·98	4·06	..	+ 05	..
00	+ 01	− 04	+ 02	..	..	..	+·0	·	+·01	·00	..	−·01	..

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments* { *No. 12. 3" Double-Floats,*
No. 13. 1⅝" Double-Floats,

	1	2			3			4				5				
		DEPTH.			FALL of Water Surface.			WIND.					SUBSURFACE past the cen- [Each Velocity is the			
								From		To			Nominal			
Serial No.	Date, 1875–76.	Actual.	Variation	Length of Rod.	Upper ½ mile.	Lower 4½ miles.	Local Slope	Direction.	Velocity.	Direction.	Velocity	Timekeeper's Initial	0	1	2	3
		H		l	F_1	F_2	S									
Series 12.	22 2 '75	7·05	00	7	5·75	4·15	Not observed.	..	0	N	15	W	4·00	3·90	3·66	3·90
	" "	05	00	7	"	"		N	15	NE	20	B	4·05	3·85	4·00	4·05
	26-2- "	60	·00	7	5·60	4·10		N	13	E	14	W	3·85	4·00	3·85	3·80
	" "	60	00	7	"	"		N	13	NW	6	B	3·75	3·75	3·75	3·80
	" "	60	00	7	"	"		NW	8	W	17	W	3·66	3·80	3·75	3·61
	" "	60	·00	7	"	"		W	17	W	20	B	3·80	3·70	3·95	3·90
	" "	60	00	7	"	"		E	17	W	2	W	3·61	3·75	3·85	3·85
	" "	60	·00	7	"	"		W	22	N	17	B	3·95	3·85	3·90	3·85
	24-2- "	55	00	7	5·83	4·05		..	0	..	0	W	3·75	3·80	3·95	3·95
	" "	58	+·05	7	5·82	4·08		..	0	SE	0	B	3·66	3·85	3·75	3·70
	" "	60	00	7	5·80	4·10		SE	6	SE	[illegible]	W	3·61	3·85	4·00	3·61
	" "	60	00	7	"	"		SE	9	SE	20	B	3·70	3·90	3·75	3·75
	" "	60	·00	7	"	"		SE	20	SE	1	W	3·70	3·75	3·90	3·70
	" "	60	·00	7	"	"		SE	19	S	15	B	3·70	3·90	3·90	3·90
	23-2- "	·55	00	7	5·85	4·05		..	0	..	0	W	3·80	3·95	3·85	3·75
	" "	55	00	7	"	"		..	0	..	0	B	3·75	3·85	3·80	3·95
	" "	·55	00	7	"	"		..	0	..	0	W	3·85	3·85	3·90	3·66
	" "	·55	·00	7	"	"		..	0	..	0	B	3·90	3·95	3·80	4·00
	" "	55	00	7	"	"		..	0	..	0	W	3·95	3·85	3·80	3·70
	" "	55	·00	7	"	"		..	0	..	0	B	3·90	4·05	3·95	3·75
δ	Range,	·10	..	0	·10	·10	..	..	..	..	.	..	·44	·35	·34	·41
v	Means of 20,	7·50	..	7	5·81	4·07	..	S8E2				..	3·80	3·86	3·85	3·81
v′	Parabolic, (v′)		..		..		..	..		..		..	3·81	3·85	3·85	3·80
Δ	Discrepancies, (v − v′)		..		..		..	..		..		..	− ·01	+ ·01	·00	+ ·01
Series 13.	21 7-'76	7·11	+ ·02	6	6·09	3·81	220	..	0	..	0	W	4·14	4·20	4·05	3·97
	" "	14	+ ·03	6	6·06	3·86	"	..	0	..	0	R	4·00	4·03	4·14	[illegible]
	" "	16	+ ·02	6	6·01	3·86	"	..	0	..	0	W	3·83	4·14	4·14	[illegible]
	" "	17	·00	6	6·03	3·87	"	..	0	..	0	R	4·22	4·17	4·21	[illegible]
δ	Range,	·06	..	0	·06	·06	·000	..	..	..	..	..	·40	·17	·17	·23
v	Means of 4,	7·1	..	6	6·06	3·85	220		0			..	4·05	4·14	4·14	4·07
v′	Parabolic, (v′)		..		..		..	..		..		..	4·06	4·12	4·12	4·11
Δ	Discrepancies, (v − v′)		..		..		..	..		..		..	− ·01	+ ·02	+ ·01	− ·04

TABLE XII.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1″ wood Rods
and 1″ tin Tube Rods }].

6								7	8			9	
VELOCITIES tral vertical. mean of three observations].							Rod velocity	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations			DIFFERENCES	
Depths (z)									Discharge/Depth	Mid depth Velocity	Rod Velocity Mean of 6 trials	$(v_{\frac{1}{2}} - U)$	$(s - U)$
4	5	6	7	8	9	10	v_R	D	U	$v_{\frac{1}{2}}$	s		
3 53	3 66	3 53	3 33	..	..	..	3 20	28 0	3 70	3 59	3 70	− 11	00
3 90	3 61	3 70	3 29	..	..	..	3 02	28 7	3 75	3 93	3 66	+ 18	− 09
3 57	3 41	3 66	3 16	..	..	..	2 86	27 7	3 64	3 62	3 61	− 02	− 03
3 53	3 66	3 41	3 23	..	..	..	3 12	27 5	3 62	3 62	3 45	00	− ·17
3 66	3 49	3 33	3 26	..	..	..	3 22	27 0	3 55	3 65	3 41	+ 10	− 14
3 80	3 57	3 57	3 16	..	..	..	2 91	28 7	3 77	3 82	3 61	+ 05	− 16
3 75	3 41	3 41	3 13	..	..	..	2 96	27	3 57	3 77	3 72	+ 20	+ 15
3 57	3 61	3 41	2 97	..	..	..	2 71	27	3 61	3 63	3 5	+ 02	− 05
3 95	3 53	3 37	3 23	..	..	..	3 15	27 7	3 66	3 95	3 49	+ 29	− 17
3 80	3 75	3 45	3 30	..	..	..	3 21	27 7	3 66	3 78	3 61	+ 12	− 05
3 80	3 45	3 45	3 16	..	..	..	2 99	27 1	3 56	3 76	3 66	+ 20	+ 10
3 75	3 70	3 45	3 03	..	..	..	2 ,8	27 5	3 62	3 75	3 49	+ 13	− ·13
3 66	3 75	3 45	3 12	..	..	..	2 92	27 4	3 61	3 67	3 57	+ 06	− 04
3 53	3 41	3 53	3 03	..	..	..	2 73	27 4	3 60	3 60	3·70	00	+ 10
3 61	3 61	3 49	2 97	..	..	..	2 68	27	3 62	3 64	3 66	+ 02	+ ·04
3 70	3 53	3 53	3 11	..	..	..	2 89	27 6	3 66	3 76	3 49	+ 10	− 17
3 45	3 75	3 37	3·09	..	..	..	2·94	27	3 61	3 50	3 23	− 11	− 38
3 75	3 66	3 49	3 30	..	..	..	3·20	28	3 75	3·81	3 80	+ 06	+ 05
3 61	3 70	3 49	3 23	..	..	·	3 09	27	3 65	3 63	3 49	− 02	− 16
3·66	3 75	3 53	3 26	..	..	..	3 11	28·1	3 72	3 68	3 5	− 04	− 15
50	34	·37	36	..	..	..	54	1 7	22	45	37	40	30
3 68	3 60	3 48	3 17	..	..	..	2 98	27 7	3 65	3 71	3 57	+ ·06	− ·05
3 72	3 59	3 43	3 22	..	..	..	3 05	27 6	3 64	3 74	..	+ 10	..
− 04	+ 01	+ 05	− 05	..	..	..	− ·16	+ 1	+ 01	− 03	..	− 04	..
4·08	4 00	3 73	3 57	..	..	..	3 55	28·	3·98	4 03	3·8	+ ·05	− 11
4·05	3 87	3 75	3 61	..	..	..	3 59	28 4	3·97	4 11	3·8	+ 14	− 14
3 97	3·90	3 70	3 70	..	..	..	3 70	28 7	3 94	3·98	3 86	+ 04	− ·08
4 14	4 11	3 73	3 70	..	..	..	3·69	29·1	4·05	4 13	3 86	+ 08	− ·09
17	24	05	13	..	..	..	15	9	·11	15	04	10	·11
4·06	3·97	3·73	3·65	..	..	..	3·6	28·	3·99	4·06	3·86	+ ·07	− 15
4 04	3·94	3 79	3·60	..	..	..	3 37	28·3	3 99	4·08	..	+ ·09	..
+ 02	+ ·03	− 06	+ 05	..	..	..	+ ·06	[illegible]	00	− 03	..	− ·02	..

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[Instruments—1½" Double-Floats,

Serial No.	1 Date 1876 77 78.	2 Depth. Actual. H	Depth. Variation.	Length of Rod. l	3 Fall of Water-Surface. Upper ½ mile F_1	Fall of Water-Surface. Lower ½ mile F_2	Local Slope. S	4 Wind. From Direction.	Wind. From Velocity.	Wind. To Direction.	Wind. To Velocity.	5 Timekeeper's Initial	Subsurface- past the cen- (Each Velocity is the Nominal 0	1	2	3
Series 14.	7-1-78	6·91	+·03	6	5·94	3·21	212	..	0	S	[illegible]	G	3·97	4·14	3·97	4·00
	" "	·93	·00	6	5·92	3·23	"	S	3	SW	[illegible]	F	4·00	4·00	4·14	4·03
	" "	·93	−·03	6	5·93	3·22	"	SW	5	S	0	G	3·77	4·03	3·90	4·00
	" "	·93	·00	6	5·95	3·20	"	S	6	S	[illegible]	F	3·75	4·11	4·03	4·14
	" "	·93	·00	6	"	"	"	S	9	S	1	G	3·87	3·97	3·97	4·03
	8-1- "	·93	·00	6	5·92	3·15	?	W	4	W	4	G	3·97	3·90	3·90	4·00
	" "	·93	·00	6	"	"	?	W	4	SW	[illegible]	F	3·97	4·29	4·06	4·00
	19-7-76	·93	·00	6	6·00	3·33	?	NNE	[illegible]	..	0	W	4·20	4·14	4·20	4·11
	" "	·93	·00	6	"	"	?	..	0	..	0	H	4·06	4·22	4·23	4·00
	12-7- "	·93	·00	6	5·93	3·43	?	NE	10	E	1	H	3·70	4·00	3·97	4·03
	11-1-78	·63	·00	6	5·97	3·03	?	N	8	W	[illegible]	F	3·63	3·97	4·22	4·03
	" "	·63	·00	6	"	"	?	W	8	S	[illegible]	G	3·87	3·97	3·9[illegible]	4·11
	" "	·63	·00	6	"	"	?	S	5	NE	[illegible]	F	3·83	3·80	4·05	3·8[illegible]
	" "	·63	·00	6	"	"	?	NE	8	S	[illegible]	G	3·77	3·93	4·0[illegible]	3·87
	" "	·63	·00	6	"	"	?	S	5	S	11	F	3·51	3·93	4·13	3·87
	" "	·63	·00	6	"	"	?	S	11	W	1	G	3·70	3·90	3·93	3·87
R	Range.	·30	..	0	·03	·32	?	..	..	..		·	·73	·49	·39	·27
v	Means of 16.	6·77	..	6	5·96	3·19	?	S & W 3				..	3·90	4·02	4·06	4·00
v′		Parabolic, (v′)	..	..	..	..	..	..	..	..	..	..	3·93	3·98	4·03	4·01
Δ		Discrepancies, (v − v′)	..	..	..	..	..	..	..	..	..	..	−·03	+·04	+·03	−·01
Series 15.	29-7-76	6·25	·03	6	6·25	[illegible]	Not observed.	N	6	N	0	W	4·11	4·22	4·20	4·26
	" "	·25	·03	6	"	"		N	6	N	4	H	4·17	4·22	4·29	3·92
	" "	·25	·03	6	"	"		N	4	..	0	W	4·14	4·35	4·19	4·32
	" "	·25	·03	6	"	"		..	0	W	10	H	4·22	4·29	4·26	4·20
	" "	·25	·03	6	"	"		N	10	N	10	W	4·17	4·26	4·29	4·29
	" "	·25	·00	6	"	"		N	10	W	1	H	4·41	4·05	4·31	4·29
	12-12-77	·15	·00	5½	5·92	[illegible]		W	5	W	[illegible]	G	3·80	4·03	4·03	3·85
	" "	·15	·00	5½	"	"		W	3	S	0	F	3·5[illegible]	3·95	3·9[illegible]	3·95
	" "	·15	·00	5½	"	"		S	10	S	10	G	3·90	4·03	4·00	4·03
R	Range.	·10	..	½	·33	·30	..	..	..	..	..	..	·61	·43	·37	·47
v	Means of 9.	6·22	..	5·83	6·15	3·62	..	N 3				..	4·09	4·16	4·17	4·12
v′		Parabolic, (v′)	..	..	..	..	..	..	..	..	..	..	4·10	4·15	4·16	4·11
Δ		Discrepancies, (v − v′)	..	..	..	..	..	..	..	..	..	..	−·01	+·01	+·01	+·01

TABLE XIII.

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1″ tin Tube-Rods]

8								7	8			9	
VELOCITIES tral vertical mean of three observations]							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical			DIFFERENCES	
									Various Approximations				
Depths (z)									Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 6 trials		
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}H}$	u	($v_{\frac{1}{2}H}$ − U)	(u − U)
3 92	3 90	3 87	3 77	..	..	..	3 77	27 4	3 97	3 96	3 88	− 01	− 09
3·92	3 87	3 85	3 53	..	..	..	3 53	27 2	3 93	3 96	3 76	+ 03	− 17
3 73	3 90	3 75	3 61	..	..	..	3 61	27 1	3 92	3 88	3 75	− 04	− 17
3 75	3 73	3 82	3 61	..	..	..	3 61	27 1	3 93	3 96	3 82	+ 03	− 11
3 82	3 92	3 75	3 68	..	.	..	3 68	27 0	3 92	3·94	3 82	+ 02	− 10
3 95	3 85	3 68	3 57	.	.	..	3 57	26 0	3 87	3 98	3 74	+ 11	− 13
4·00	3 75	3 75	3 75	..	..	..	3·75	27 2	3 98	4·05	3 68	+ 07	− 30
4·05	3 75	3 85	?		..	..	3 94	27 6	4·01	4 08	3 97	+ 07	− 04
3 87	4 17	3 82	?	.	..	..	3 52	27 8	4·06	3 94	3 85	− 12	− 21
3·80	3 85	3 66	?	.	..	..	3 54	25·9	3 90	3·95	3 75	+ 05	− ·13
3·87	3·90	3 70	3 53	..	..	..	3 53	25 5	3·90	3·93	3 81	+ 08	− 09
3 97	3 87	3 75	3 66	..	..	..	3·66	26·1	3 93	4·07	3 79	+ 14	− 14
3 90	3 73	3 66	3 61	..	..	..	3 61	25·1	3 79	3 88	3 73	+ 09	− 06
3 66	3 59	3 61	3 57	..	..	..	3 57	25·4	3 77	3 80	3 5	+ 03	− 20
3·87	3·90	3 59	3 51	..	..	..	3 51	25·4	3·83	3·87	3 66	+ 04	− 17
3 73	3·82	3 35	3 43	..	..	..	3 45	25·1	3 79	3·83	3 69	+ 04	− ·10
39	58	32	? 34	..	..	..	51	2 6	29	28	40	26	26
3 86	*3·84*	*3 72*	*?3·60*	..	..	..	*3·61*	*26·5*	*3·93*	*3·95*	3 77	+ 01	− 14
3 95	3 82	3 65	3·47	..	..	..	3 47	26 3	3 89	3 99	..	+ 10	..
− 09	+ 02	+ 08	+ 13	..	..	..	+ 14	+ 2	+ 02	− 04	..	− 08	..
3·97	3·92	3 77	..	..	..	..	3 77	25·6	4 10	4 22	3·81	+ 12	− 29
4 11	3·87	3 77	..	..	..	..	3 74	25 0	4 00	3 94	3 73	− 06	− 27
4 00	3 87	3 77	..	..	..	..	3 74	25 9	4 15	4 28	3 77	+ 13	− 35
4·05	3·87	3 72	..	..	..	..	3 68	25 6	4 10	4 18	3 76	+ 08	− 34
4 17	3 97	3·90	..	..	..	..	3 88	26·0	4 16	4 27	3 81	+ 11	− ·35
4 05	4·03	3 85	..	..	..	..	3·80	25·6	4 13	4 24	3·8	+ 11	− 26
3 97	3·59	3 73	..	..	..	..	3 75	23·6	3 83	3·86	3 59	+ 03	− 24
4 00	3 68	4 00	..	..	..	..	4·05	23·9	3·88	3·95	3 76	+ 07	− 12
3 68	3 66	3·59	..	..	..	..	3 58	23 5	3 68	4·00	3·80	+ 12	− ·05
49	44	41	..	..	..	..	4	2 4	·23	·42	25	19	·30
4 00	3·83	3·79	..	..	..	..	3·77	25·0	4·03	4 10	3·7	+ ·07	− 20
4 02	3 89	3 70	..	.	..	..	3·83	25 1	4 03	4 11	..	+ 08	..
− 02	− 06	+ 09	..	..	..	..	+ 12	− 1	00	− 01	..	− ·01	..

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments—1⅜" Double-Floats,*

	1	2			3			4				5				
		DEPTH.			FALL of Water-Surface			WIND.					SUBSURFACE-past the cen- [Each Velocity is the Nominal			
								From		To						
Serial No.	Date, 1876.	Actual.	Variation.	Length of Rod.	Upper 5 miles.	Lower 4½ miles.	Local Slope.	Direction.	Velocity	Direction.	Velocity.	Timekeeper's Initial.				
		H		r	F_1	F_2	S						0	1	2	3
Series 16.	20-7-'76	6·00	·00	5	6·30	2·80	250	..	0	..	0	W	4·03	3·97	3·97	3·9
	„ „	00	·00	5	„	„	„	..	0	..	0	H	3·85	4·08	4·00	3·95
	„ „	·00	·00	5	„	„	„	..	0	..	0	W	3·95	4·03	4·08	3·97
	„ „	·00	·00	5	„	„	„	..	0	..	0	H	4·14	4·17	4·11	4·08
	„ „	·00	·00	5	„	„	„	..	0	v	1	W	4·14	4·08	4·08	3·85
	„ „	·00	·00	5	„	„	„	v	1	..	0	H	4·03	4·11	4·00	4·05
	„ „	·00	·00	5	„	„	„	..	0	..	0	W	3·97	4·00	4·11	3·85
	„ „	·00	·00	5	„	„	„	..	0	v	1	H	4·03	4·00	4·03	3·97
	„ „	·00	·00	5	„	„	„	v	1	v	1	W	3·87	4·08	4·05	4·03
	„ „	·00	·00	5	„	„	„	v	1	v	1	H	3·82	4·00	4·00	3·90
	„ „	·00	·00	5	„	„	„	v	1	v	10	W	4·08	4·05	4·03	4·00
	„ „	·01	+·01	5	6·39	2·81	„	v	10	v	9	H	3·95	4·00	4·11	3·87
	„ „	·02	+·01	5	6·38	2·82	„	v	9	s	1	W	3·97	3·97	4·08	3·80
	„ „	·03	+·01	5	6·37	2·83	„	s	12	s	1	H	3·92	4·03	4·05	3·70
	„ „	·04	+·01	5	6·36	2·84	„	s	12	s	6	W	3·90	4·20	3·97	3·80
	„ „	·05	+·01	5	6·35	2·85	„	s	6	s	5	H	4·03	4·17	4·08	3·97
δ	Range,	·05	..	0	·28	·05	000	..	..	..	..	..	·32	·23	·14	·38
v	Means of 16	6·01	..	5	6·37	2·81	250	S 4				..	3·98	4·06	4·05	3·92
v′		Parabolic, (v′)	..	..	..	..	..	..				..	3·99	4·04	4·02	3·96
Δ		Discrepancies, (v − v′)	..	..	..	..	..	..				..	−·01	+·02	+·03	−·04
Series 17.	27-7-'76	5·55	·00	5	6·35	3·05	300	s	6	s	7	H	3·70	3·87	3·61	3·70
	„ „	·55	·00	5	„	„	„	s	7	s	6	W	3·75	3·85	3·77	3·82
	„ „	·55	·00	5	„	„	„	s	6	s	6	H	3·77	3·92	3·87	3·75
δ	Range,	·00	..	0	·00	·00	000	..	..	..	..	..	·07	·07	·26	·12
v	Means of 3,	5·55	..	5	6·35	3·05	300	S 6				..	3·74	3·88	3·75	3·76
v′		Parabolic, (v′)	..	..	..	..	..	..				..	3·76	3·82	3·81	3·73
Δ		Discrepancies, (v − v′)	..	..	..	..	..	..				..	−·02	+·06	−·06	+·03

TABLE XIV.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1" tin Tube-Rods]

6								7	8			9	
VELOCITIES tral vertical. mean of three observations] Depths (x)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations			DIFFERENCES	
									Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 8 trials		
4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}}$	u	($v_{\frac{1}{2}}$ − U).	(u − U).
3·85	3·68	Not observed.	..	..	..	..	3·51	23·2	3·86	3·92	3·80	+ 06	− 06
3·87	3·61		..	..	..	..	3·35	23·1	3·85	3·95	3·86	+ 10	+ 01
4·00	3·70		..	..	..	..	3·40	23·5	3·91	3·97	3·85	+ 06	− 06
3·82	3·68		..	..	..	..	3·54	23·7	3·95	4·08	3·79	+ 13	−·16
3·80	3·75		..	..	..	..	3·70	23·5	3·92	3·85	3·81	− 07	− 11
3·85	3·64		..	..	..	..	3·43	23·4	3·90	4·05	3·81	+ 15	− 09
3·73	3·61		..	..	..	..	3·49	23·0	3·84	3·85	3·76	+ 01	− 08
3·80	3·85		..	..	..	..	3·90	23·6	3·94	3·97	3·82	+ 03	− 12
3·75	3·61		..	..	..	..	3·47	23·9	3·87	4·03	3·75	+ 16	− 12
3·73	3·76		..	..	..	..	3·59	23·0	3·83	3·90	3·88	+ 07	+ 05
3·82	3·70		..	..	..	..	3·56	23·4	3·91	4·00	3·81	+ 09	−·10
3·92	3·73		..	..	..	..	3·54	23·4	3·92	3·87	3·79	− 03	− 11
3·73	3·68		..	..	..	..	3·63	23·1	3·84	3·80	3·82	− 04	+ 01
3·80	3·70		..	..	..	..	3·60	23·2	3·84	3·70	3·85	− 14	+ 01
3·75	3·70		..	..	..	..	3·65	23·4	3·87	3·80	3·87	−·07	00
3·90	3·70		..	..	..	..	3·49	23·8	3·93	3·97	3·87	+ 04	− 06
27	24	..	..	..	..	..	·50	8	12	38	·13	30	·21
3·82	3·69	..	..	..	..	..	3·55	23·3	3·89	3·92	3·82	+ 03	−·07
3·83	3·65	..	..	..	..	..	3·40	23·2	3·87	3·96	..	+ 09	..
− 01	+ 04	..	..	..	..	..	+ 16	·0	+ 02	− 04	..	−·06	..
3·61	3·33	..	..	..	..	..	3·16	20·1	3·62	3·68	3·57	+ 08	− 03
3·59	3·41	..	..	..	..	..	3·31	20·[illegible]	3·69	3·81	3·56	+ 12	− 11
3·47	3·37	..	..	..	..	..	3·31	20·4	3·63	3·78	3·64	+ 10	− 04
·14	08	..	..	..	..	..	13	·4	07	·13	07	·06	·07
3·56	3·37	..	..	..	..	..	3·27	20·3	3·66	3·76	3·60	+ 10	− 06
3·58	3·35	..	..	..	..	..	3·19	20·3	3·66	3·76	..	+ 10	..
− 02	+·02	..	..	..	..	..	+·05	·0	·00	·00	..	·00	..

SUBSURFACE AND MEAN VELO

SOLANI RIGHT AQUEDUCT, [LEFT

[*Instruments—$1\frac{5}{8}$" Double-Floats,*

	1	2			3			4				5
		DEPTH			FALL of Water-Surface.			WIND				
								From		To		
Serial No.	Date 1876	Actual	Variation	Length of Rod.	Upper 5 miles	Lower 4½ miles	Local Slope.	Direction	Velocity	Direction	Velocity	Timekeeper's Initial.
		H		l	F_1	F_2	s					
Series 18	1 9-76	4·58	+ ·05	4	6·47	1·58	Not observed.	N	12	NW	5	W
	" "	·63	+ ·05	4	6·42	1·63		NW	8	NW	6	H
	" "	·68	+ ·05	4	6·37	1·68		NW	6	NW	6	W
	" "	·73	+ ·05	4	6·32	1·73		..	0	N	6	H
δ	Range,	·15	·	0	·15	·15	..	..	·	..		
v	Means of 4	4·66		4	6·40	1·66	..	NW½ N 6				·
v′		Parabolic, (v′)			..	..	..	..	..	..		·
Δ		*Discrepancies, (v—v′)*				..	..	..	..	..		..
Series 19	1 9 76	4·04	+ ·12	3	6·56	1·04	Not observed	SW	11	..	[illegible]	W
	" "	·15	+ ·10	3	6·45	1·15		..	0	..	[illegible]	H
	" "	·20	·00	3	6·40	1·20		..	0	·	0	W
	" "	·20	·00	3	"	"		..	0	SW	6	H
	" "	·22	+ ·03	3	6·38	1·22		SW	6	SW	[illegible]	W
	" "	·23	+ ·05	3	6·32	1·28		..	0	..	[illegible]	H
	" "	·30	·00	3	6·30	1·30		..	0	..	[illegible]	W
	" "	·30	·00	3	"	"		..	0	..	[illegible]	H
δ	Range,	·26	..	0	·26	·26	..	..	..	..	·	..
v	Means of 8,	4·21	..	3	6·52	1·21	..	SW 2				..
v′		Parabolic, (v′)			..	..	..	..	..	..		..
Δ		Discrepancies, (v — v′)				..	..	..	..	..		..
Series 20.	1 9-76	3·94	+ ·02	3	6·66	·94	Not observed.	N	8	N	4	W
	" "	·95	·00	3	6·6[illegible]	·95		N	4	N	4	H
	" "	·95	·00	3	"	"		N	4	..	[illegible]	W
	" "	·95	·00	3	"	"		..	0	..	[illegible]	H
	" "	·97	+ ·03	3	6·63	·97		..	0	SSE	7	W
	" "	·98	·00	3	6·62	·98		SSE	7	SW	11	H
	" "	·98	·00	3	"	"		SW	11	SW	11	W
	" "	·98	·00	3	"	"		SW	10	SW	11	H
	" "	4·04	+ ·12	3	6·56	1·04		SW	11	·	[illegible]	W
	" "	·15	+ ·10	3	6·45	1·15		..	0	..	[illegible]	H
δ	Range,	·21	..	0	·21	·21	..	..	..	..	·	..
v	Means of 10	3·99	·	3	6·61	·99	..	SW 3				..
v′		Parabolic, (v′)						..	..	..		..
Δ		Discrepancies (v — v′)								..		·

CITIES PAST A VERTICAL. TABLE XV.

Aqueduct Closed]—Central Vertical.

and 1" tin Tube-Rods.

8						7	8			9	
Subsurface Velocities past the central vertical. (Each Velocity is the mean of three observations.) Nominal Depths (s)					Rod velocity.	Discharge past the vertical.	Mean Velocity past the vertical. Various Approximations: Discharge, Depth	Mid-depth Velocity.	Rod Velocity Mean of 6 trials	Differences	
0	1	2	3	4	v_R	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$
6 59	6 45	6 38	6 25	6·06	5 95	28·9	6 31	6 34	6 38	+ 03	+ 07
5 88	6 52	6 52	6 38	6 25	6 14	29 5	6 37	6 48	6 18	+ 11	−·19
6·18	6 45	6·39	6·52	6 12	5 85	29 7	6·35	6 43	6 35	+ 08	00
7 06	6·67	6 45	6·45	6 52	6·57	31 1	6·58	6·45	6·38	−·13	− 20
1 18	22	14	27	46	72	2 2	27	·14	·20	24	·27
6 43	6 52	6 43	6 40	6 24	6 14	29 6	6 40	6 43	6 32	+·03	− 08
6 44	6 49	6 47	6 39	6 24	6 10	29 8	6 39	6 45	..	+ 06	..
− 01	+ 03	− 04	+ 01	00	+ 04	0	+ 01	− 02	..	− 03	..
5 71	5 82	5 41	5 61	Not observed	5 82	22 8	5 65	5 41	5 53	− 24	− 12
6 25	5 94	5 77	5 66		5 53	21 1	5 80	5 76	5 61	− 04	− 19
5 66	5 88	5 82	5 61		5 36	24 0	5 71	5 80	5 77	+ 09	+ 06
6 12	5 88	6 12	5 88		5 59	24 9	5 93	6 10	5·86	+ 17	− 05
6 00	6 00	5 82	5 61		5 39	24 3	5 77	5 80	5·82	+ 03	+·05
6 38	5 88	6 00	6 00		6·00	25 7	6 00	6 00	6·03	00	+ 03
6 12	6·12	5 88	5 77		5 63	25 4	5·90	5 86	6 00	− 04	+ 10
6 18	6·18	6·12	5 88		5 57	26 8	6 00	6 08	5 91	+ 08	− 09
72	36	71	39	..	65	3 0	35	69	50	41	29
6·05	5 96	5 87	5 75	..	5·61	24 6	5 85	5 85	5 82	·00	−·03
6 05	5 96	5 87	5 75	..	5 60	24 6	5 84	5 85	..	+ 01	..
00	00	00	00	..	+ 01	0	+ 01	00	..	− 01	..
5 31	5 66	5 50	5 17	..	4 86	21 2	5 38	5 50	5 48	+ 12	+·10
5 82	5 56	5 17	5 22	..	5 24	21 4	5 37	5 18	5 33	− 19	− 04
5 31	5 36	5 46	5 13	..	4 82	20 8	5 27	5 46	5 41	+ 19	+ 14
5 66	5 66	5 41	5 17	..	4 94	21 3	5 40	5 41	5 38	+ 01	− 02
5 41	5 50	5 46	5 26	..	5·0	21·3	5 38	5 46	5 48	+ 03	+ 10
5 94	5·61	5 71	5 26	..	4·82	21	5 50	5 71	5 56	+ 21	+ 06
5 71	5 66	5 41	5 26	..	5 11	21 7	5 44	5·41	5 50	− 03	+ 06
5 41	5 77	5 66	5 26	.	4·84	21·5	5 48	5 66	5 69	+ 15	+ 21
5 71	5 82	5 41	5 61	..	5·82	22 8	5 65	5 41	5 53	− 24	− 12
6 25	5 94	5 77	5·66	.	5 57	21 1	5 80	5 76	5 61	− 04	− 19
94	58	60	53	..	1 00	3 3	·53	33	30	45	40
5 65	5 65	5·50	5·30	..	5 11	21 8	5 47	5·50	5·50	+ 03	+·03
5 65	5 64	5 51	5 29	..	4 90	21 8	5 45	5·52	..	+·07	..
00	+ 01	− 01	+ 01	..	+ 13	0	+ 02	−·01	..	− 04	..

SUBSURFACE AND MEAN VELO-

SOLÁNÍ EMBANKMENT MAIN SITE—

[*Instruments—1⅜" Double-Floats,*

Serial No.	1	2				3				4				5			
	Date, 1876-77-78.	Depth.			Length of Rod	Fall of Water-Surface				Wind.				Timekeeper's Initial	Sub- past (Each Nomi-		
		Above Datum	Actual.	Variation.		Upper 4 miles	1 mile below Site	Lower 4½ miles	Local Slope.	From Direction	Velocity	To Direction	Velocity				
		A	H		l	F_1	F_2	F_3	S						0	1	2
Series 21.	30-12-'76	0 82	11 00	+ 01	9½	4 76	1 17	5 50	?	SW	5	SW	9	W	4 32	4 48	4 38
	" "	81	·02	+ 03	9½	4 74	"	5 52	?	SW	9	W	12	P	4 35	4 51	4 48
	3-1-'77	81	10 99	00	9	4 77	1 18	5·4[illegible]	21[illegible]	NE	0	E		P	4 65	4 48	4 38
	" "	81	99	00	9	"	"	"	"	E	9	E	6	W	4 22	4 29	4 44
	" "	81	99	00	9	"	"	"	"	E	8	E	10	P	4 11	4 32	4 17
	" "	81	99	00	9	"	"	"	"	E	10	E	14	W	4 29	4 51	4 55
	4-1- "	70	88	00	9	4·76	1 17	5·40	19·	..	0	..	0	W	4 33	4 55	4 55
	" "	70	8[illegible]	00	9	"	"	"	"	..	0	..	0	P	4 61	4 72	4 55
	" "	70	88	00	9	"	"	"	"	.	0	.	0	W	4 44	4 48	4 55
	" "	71	8[illegible]	+ 02	9	4 77	"	5 41	"	S	7	SE	5	P	4 17	4 48	4 55
	" "	73	91	+ 02	9	4 76	"	5·43	"	SE	5	SW	6	W	4 35	4 72	4 41
	5-1- "	56	74	+ 02	9	4 77	1 23	5·30	?	NE	10	NE	10	P	4 41	4 48	4 29
	" "	57	75	·00	9	4 76	1 24	"	?	NE	10	NE	5	W	4 61	4 48	4 10
	" "	57	75	00	9	"	"	"	?	NE	5	E	1.	P	4 38	4 48	4 33
	" "	57	75	00	9	"	"	"	?	E	12	E	·	W	4 44	4 51	4·65
	" "	·57	·75	00	9	"	"	"	?	E	4	E	5	P	4 61	4 35	4 55
δ Range,		25	23	..	5	04	07	22	?	..	..	..	..	..	54	43	48
v Means of 16,		0·71	10·89	..	9·00	4 77	1 49	5·3[illegible]	?	E 4				..	4·39	4 49	4·44
v′		Parabolic, (v′)			..	..	..	..	..	..		..		..	4 44	4 44	4 42
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..		..		..	− 03	+ 05	+ 02
Series 22.	2 2-'77	6·86	8·03	00	7	4 37	1 36	3·37	23·	..	0	..	0	P	3 45	3 70	3·82
	" "	87	·01	+ ·02	7	4 [illegible]6	"	3 [illegible]	"	..	0	..	0	W	3 47	3 77	3 75
	" "	87	·01	− 01	7	"	"	"	"	..	0	..	0	P	3·53	3 47	3 43
	" "	·88	·0[illegible]	+ 03	7	4·33	"	3·39	"	..	0	SW		W	3 57	3 61	3 73
	" "	8[illegible]	·06	− 01	7	4·[illegible]	"	3·40	"	SW	9	SW	17	P	3 61	3 66	3·64
	9-1-'78	8[illegible]	7 [illegible]	− 01	7½	4 61	1 44	2 9[illegible]	?	S	3	S	7	P	3 57	3 64	3·85
	" "	·80	[illegible]	− 01	7½	4·63	1 [illegible]	2 85	?	S	7	S	[illegible]	G	3 41	3 57	3 55
	4 1- "	74	[illegible]1	+ 16	7	4·6[illegible]	1 30	3·44	?	E	5	E b S		G	3 39	3 59	3 61
	17 12 '77	74	[illegible]1	00	7	4 5[illegible]	1 41	2·6[illegible]	7	E b S	8	SE	7	P	3 39	3 70	3 82
	" "	74	[illegible]1	00	7	"	"	"	?	SE	7	SE	1[illegible]	G	3 58	3 77	3 80
	15-12- "	72	·8[illegible]	− ·01	7	4 61	1·3[illegible]	2 8[illegible]	?	W	5	S	[illegible]	G	3 53	3 47	3 73
	4-1-'78	·66	83	00	7	4 [illegible]	1·34	2 9[illegible]	?	E	10	E		P	3 37	3·68	3 55
	3-1- "	·64	81	− ·01	7	4 64	1 36	2 95	?	E	4	E	11	G	3 34	3 61	3 55
	23-12-'77	·64	·81	·00	7	4 61	1·36	2 9[illegible]	24	NW	6	..	0	P	3 35	3 53	3 39
	" "	·64	81	00	7	"	"	"	"	..	0	S	7	G	3 66	3·53	3 51
	" "	·64	81	00	7	"	"	"	"	S	7	S	1[illegible]	P	3 59	3 64	3 55
δ Range,		23	25	..	5	43	22	·73	?	..	..	..	..	..	31	30	46
v Means of 16,		6·76	7 9[illegible]	..	7 4	4·64	1·35	3·0[illegible]	?	SSE 4				..	3·45	3·6[illegible]	3·61
v′		Parabolic, (v′)			..	..	..	..	..	..		..		..	3 51	3 58	3 61
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..		..		..	− ·03	+ ·08	+ ·03

CITIES PAST A VERTICAL TABLE XVI

CENTRAL VERTICAL

and 1″ tin Tube-Rods]

6									7	8			9	
SURFACE VELOCITIES the central vertical Velocity is the mean of three observations]								Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations			DIFFERENCES	
nal Depths (z)										Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 3 trials		
3	4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}H}$	u	$(v_{\frac{1}{2}H} - U)$	$(u - U)$
4 08	4 26	4 32	4 05	4 05	4 17	4 26	4 08	3 90	46 2	4 20	4 13	3 90	− 07	− 30
4 55	4 61	4 05	4 32	4 32	4 20	3 92	4 11	4 30	47 4	4 18	4 19	3 95	− 09	− 33
4 48	4 41	4 29	4 48	4 51	4 48	4 14	4 11	4 08	48 0	4 37	4 39	3 95	+ 02	− 42
4 38	4 11	4 29	4 29	4 08	4 05	3 95	3 92	3 89	46 8	4 17	4 29	3 93	+ 12	− 24
4 11	4 22	4 05	4 08	4 20	4 00	3 40	4 08	4 16	45 4	4 13	4 07	3 93	− 06	− 20
4 20	4 44	4 26	3 95	3 92	3 95	4 05	3 92	3 81	46 7	4 16	4 10	4 04	− 06	− 12
4 55	4 44	4 29	4 41	4 41	4 17	4 00	4 20	4 38	47 4	4 36	4 34	3 91	− 02	− 39
4 42	4 80	4 51	4 41	4 41	4 20	4 20	4 26	4 31	48 4	4 45	4 47	4 15	+ 02	− 30
4 51	4 51	4 32	4 26	4 32	4 17	4 03	3 97	3 92	46 8	4 30	4 29	4 10	− 01	− 20
4 58	4 51	4 26	4 55	4 48	4 08	4 03	4 11	4 15	47 4	4 35	4 39	4 10	+ 04	− 25
4 36	4 61	4 44	4 44	4 32	4 32	4 32	4 17	4 03	47 8	4 38	4 44	4 3	+ 06	− 05
4 29	4 20	4 20	4 11	4 17	4 29	3 90	3 95	3 99	46 0	4 19	4 17	3 83	− 02	− 36
4 58	4 22	4 05	3 90	3 80	4 17	3 92	4 17	4 36	44 9	4 18	3 99	3 99	− 19	− 28
4 35	4 55	4 38	4 22	4 22	4 29	4 14	4 05	3 98	46 2	4 30	4 32	3 68	+ 02	−·62
4 48	4 58	4 14	4 32	3 77	4 00	4 11	3 85	3 65	45 3	4 22	4 21	3 81	00	− 34
4 41	4 35	4 48	4 11	4 14	4 29	4 29	4 17	4 08	46 [illegible]	4 32	4 34	3 90	+ 02	− 36
50	69	46	65	74	53	52	41	73	3 5	32	48	65	·31	57
4 39	4 43	4 26	4 24	4 10	4 18	4 07	4 07	4·[illegible]	46 5	4 27	4 26	3·9[illegible]	− 01	−·30
4 40	4 37	4 33	4 28	4 22	4 15	4 07	3 98	3 89	46 4	4 26	4 31	..	+ 05	..
− 01	+·06	− 07	− 04	− 03	+ 03	00	+ 09	+ 19	+ 1	+ 01	− 05	..	− 06	..
3 87	3 55	3 31	3 39	3 14	?	..	..	2 88	28 1	3 50	3 55	3 33	+ 05	− 17
3 57	3 51	3 53	3 33	3 35	?	..	..	3 3	28 4	3 53	3 57	3 34	+ 04	− 19
3 45	3 51	3 16	3 28	3 43	?	..	..	3 59	27	3 39	3 56	3 3	+ 17	− 16
3 53	3 49	3 41	3 33	3 31	?	..	..	3 08	27	3 44	3 49	3 20	+ 05	− 15
3 53	3 31	3 39	3 24	3 21	?	..	..	3 18	27	3 44	3 37	3 21	− 07	− 23
3 68	3 3	3 61	3 28	3 36	3 47	..	..	3 4	·8	3 53	3 35	3 31	− 15	− 2
3 75	3 54	3 68	3 41	3 33	3 3	..	..	3 3	26	3 55	3 55	3 26	00	− 2
3 59	3 55	3 51	3 4	3 35	3 35	..	..	3 3	27 7	3 51	3 55	3 28	+ 04	− 2
3 45	3 71	3 45	3 21	3 28	3 16	..	..	3 16	27 0	3 48	3 6	3 1	+ 25	− 29
3 59	3 55	3 49	3 35	3 33	3 27	..	..	3 1	27 8	3 52	3 55	3 20	+·03	− 20
3 33	3 55	3 19	3 25	3 14	3 31	..	..	3·31	·64	3 35	3 54	3 3	+ 19	− 0
3 73	3 68	3 43	3 41	3 21	3 33	..	..	3 2	27·4	3 50	3·65	3 34	+ 15	− 16
3 51	3 57	3 30	3 35	3 30	3 26	..	..	3 20	·65	3 44	3 56	3 34	+ 12	− 09
3 47	3 68	3 49	3 29	3 28	3 24	..	..	3 24	26·8	3·43	3·66	3·41	+ 23	− 0
3·61	3 54	3 28	3 41	3 26	3 31	..	..	3 34	26	3 44	3 52	3 2	+ 08	−·17
3 54	3 51	3 41	3 39	3 22	3 24	..	..	3 24	·71	3·41	3 52	3·24	+·05	− 2
54	42	32	26	29	? ·33	..	..	71	2	20	41	27	46	2
3 57	3 5	3·42	3·34	3 26	? 3·27	..	..	3 26	27	3·47	3·5	3 2	+·03	− 15
3 60	3 35	3 47	3 34	3·15	2 93	..	..	2 9	27 4	3 45	3 56	..	+ 11	..
− 03	00	− 05	00	+ 08	+? 29	..	..	+ 2	+ 1	+·02	−·01	..	−·03	..

SUBSURFACE AND MEAN VELO-

SOLÁNI EMBANKMENT MAIN SITE—

[*Instruments—1⅝" Double-Floats,*

Serial No.	1 Date, 1876-77.	2 Depth. Above Datum. h	Actual. H	Variation	Length of Rod. l	3 Fall of Water-Surface. Upper 4 miles. F_1	1 mile below Site. F_2	Lower 4½ miles. F_3	Local Slope. S	4 Wind. From Direction.	Velocity.	To Direction.	Velocity	5 Timekeeper's Initial.	Subsur- past the [Each Velocity Num- 0	1	2
Series 23.	25-10-'76	6·63	7·60	·00	6	5 20	1·15	3 33	Not observed.	..	0	..	0	P	4·08	4·44	4·17
	" "	·63	·80	−·01	6	"	"	"		..	0	..	0	W	4·29	4·32	4·29
	" "	·62	·79	·00	6	5·21	"	3·34		..	0	..	0	P	4·14	4 55	4·26
	" "	·62	·79	·00	6	"	"	"		..	0	..	0	W	4 26	4·38	4 29
	" "	·62	·79	−·01	6	"	"	"		..	0	..	0	P	4 38	4 22	4 58
	" "	·61	·78	−·01	6	5 22	"	3·33		..	0	..	0	W	4 32	4 32	4 20
	" "	·61	·78	+·01	6	"	"	"		..	0	..	0	P	4 29	4·05	4·00
	" "	·61	·78	−·01	6	"	"	"		..	0	..	0	W	4·32	4 55	4 22
	" "	·61	·78	+·01	6	"	"	"		..	0	..	0	P	4 35	4 26	4·17
	" "	·60	·77	−·02	6	5 23	"	3·32		..	0	..	0	W	4·17	4·55	4·32
δ	Range,	·03	·03	..	0	·03	·00	·03	..	..	..	..	..	..	·30	·50	·38
v	Means of 10,	6 62	7·79	..	6	5·21	1·15	3 34	..	Calm				..	4·26	4·36	4 25
v'		Parabolic, (v') ..			..	..	..	..		..	..	..		..	4 29	4·29	4·26
Δ		Discrepancies, (v−v')					..	..		..	..	..		..	−·03	+·07	−·01
Series 24.	25-1-'77	6·16	7 33	+·01	6¼	4 63	1·42	2·90	230	W b N	4	W	10	P	3 33	3·49	3 45
	" "	·17	·35	+·03	6¼	4·61	"	2·92	"	W	10	NW	10	W	3·41	3 61	3·33
	" "	·20	·38	+·03	6¼	4 58	"	2·95	"	NW	10	W	6	P	3 17	3·37	3 41
	" "	·22	·40	+ ·02	6¼	4 61	"	2·97	"	W	6	SW	12	W	3·45	3·35	3·37
	5-7- "	·26	·44	·00	7	4 63	1·38	2·68	?	SW	6	SW	9	P	3 51	3 35	3 37
	" "	·26	·44	·00	7	"	"	"	?	SW	7	W	21	W	3 43	3 57	3·53
δ	Range,	·11	·11	..	·30	·09	·04	·22	?	..	..	..	..	..	·34	·26	·20
v	Means of 6,	6·21	7·39	..	6·67	4·63	1 41	2·81	?	W 8				..	3·39	3·48	3·41
v'		Parabolic, (v') ..			..	..	..	..		..	..	..		..	3·42	3·43	3·42
Δ		Discrepancies, (v − v')					..	..		..	..	..		..	−·03	+·05	−·01

TABLE XVII.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL

and 1" tin Tube-Rods]

6									7	8			9	
FACE VELOCITIES central vertical is the mean of three observations). nal Depths (x)								Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical — Various Approximations.			DIFFERENCES	
										Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 6 trials		
3	4	5	6	7	8	9	10	v_B	D	U	$v_{\frac{1}{2}d}$	u	$(v_{\frac{1}{2}d} - U)$	$(u - U)$
4 17	3 87	4 05	3 92	Not observed.	..	..	..	3 69	31 9	4 09	3 90	3·8	−·19	− 24
4 20	4 08	4 03	3 87		..	..	..	3 58	31 8	4 07	4 09	3 99	+ 02	− 08
4 10	4 10	4 14	3 81		..	..	..	3 39	32 0	4 11	4 20	3 99	+ 09	−·12
4 29	4 22	4 17	3 95		..	..	..	3 56	32 3	4 14	4 23	4 03	+ 09	− 11
4 03	4 14	4 11	3 90		..	..	..	3 52	31 5	4 04	4 13	3 99	+ 09	− 05
4 41	4 14	4 03	3 92		..	..	..	3 81	32 4	4·16	4 17	4·05	+·01	− 11
4·08	3 97	3 85	3 77		..	..	..	3 63	30·6	3 93	3 98	3·90	+ 05	− 03
4 29	4 17	4 26	3 87		..	..	..	3 18	32 2	4 14	4 18	4 00	+ 04	− 14
4 08	4 11	4 08	3 70		..	..	..	3·02	30·7	3 95	4 11	3 97	+·16	+ 0
3 97	3 95	4 08	3 92		..	..	..	3 64	31 7	4·08	3 95	3 91	− 13	− 10
44	35	41	25	..	..	..	..	79	1 8	23	·33	20	35	·20
4 17	4 09	4 09	3 87	..	..	..	..	3 50	31 7	4 07	4 09	4 00	+·02	− 0
4 31	4 13	4 02	3 58	..	..	..	..	3 56	31 7	4 07	4 14	..	+·07	..
− 04	− 04	+ 06	− 01	..	..	..	..	− 06	0	00	− 05	..	− 05	..
3 30	3 23	3 17	3 11	2 83	..	..	..	2 74	23·5	3 24	3 25	3 17	+ 01	− 0
3 35	3 26	3 28	3 09	2 93	.	..	..	2 86	24·5	3 31	3 29	3 14	− 03	− 17
3 47	3 23	3 09	2·82	2 90	..	..	..	2 93	23·7	3 21	3 30	3 1	+ 09	− 05
3 28	3 17	3 03	3 03	2 88	..	..	..	2 82	23·5	3 17	3 20	3 1	+ 03	− 04
3 43	3 33	3 24	2·99	2 88	..	..	..	2 8	24·	3 29	3 36	3 2	+ 07	− 0
3 45	3 30	3 30	3·06	3·06	..	..	..	3·06	24	3 35	3 34	3·04	− 01	−·31
19	16	27	39	33	..	..	..	3	1·4	·18	16	·15	11	·3
3·38	3 25	3 19	3 02	2 91	..	..	..	2 88	24·1	3 26	3·29	3 14	+ 03	− 12
3 37	3 29	3 15	3·04	2 86	..	..	..	2 78	24 0	3 25	3 33	..	+ 07	..
+ 01	− 04	+ 01	− 02	+ 03	..	..	..	+·10	+ 1	+ 01	−·03	..	− 04	..

SUBSURFACE AND MEAN VELO-

SOLÁNÍ EMBANKMENT MAIN SITE—

[*Instruments—1⅝" Double-Floats,*

	1	2				3				4				5			
		DEPTH				FALL of Water-Surface.				WIND					SUBSUR past the Each Velocity		
										From		To			Noml		
Serial No	Date, 1876.	Above Datum	Actual	Variation.	Length of Rod.	Upper 4 miles.	1 mile below S le	Lower 4½ miles	Local Slope	Direction.	Velocity	Direction	Velocity	Timekeeper's Initial			
		h	H		l	F_1	F_2	F_3	S						0	1	2
Series 25.	23 10 '76	6 06	7 24	− 03	6	5 17	1 23	3 00	Not observed.	..	0	..	0	W	3 75	3 97	3 95
	" "	06	24	− 01	6	"	"	"		..	0	NE	5	H	4 00	4 11	4 14
	" "	06	24	+ 01	6	"	"	"		NE	5	NE	7	W	3 70	3 82	3 85
	" "	06	24	− 01	6	"	"	"		NE	7	NE	6	H	3 80	3 85	3 80
	" "	05	23	00	6	5 18	"	2 99		NE	6	NE	8	W	3 75	4 03	3 90
	" "	05	23	− 01	6	"	"	"		NE	8	NE	10	H	3 87	4 05	3 95
	" "	04	22	00	6	5 19	"	2 98		NE	10	NE	10	W	3 95	3 68	3 77
	" "	04	22	00	6	"	"	"		NE	10	ENE	12	H	3 75	3 61	3 66
	" "	12	30	+ 01	6	5 31	1 24	3 03		SW	4	W	7	W	3 90	4 03	3 95
	" "	13	31	+ 01	6	5 30	"	3 06		W	7	NW	6	H	3 97	4 11	4 14
	" "	14	32	+ 01	6	5 29	"	3 07		NW	5	NW	4	W	4 14	3 97	3 95
	" "	·15	33	+ 02	6	5 28	"	3 08		NW	4	NW	4	H	3 95	3 95	3 95
δ	Range	11	11	..	0	14	01	·10	..	..	..	..		..	44	50	48
v	Means of 12	6 08	7 26	..	6	5 22	1 23	3 02	..	NNE 4				..	3 88	3 94	3 92
v		Parabolic, (v)					..	..	..	..	..	..		..	3 89	3 92	3 91
Δ		Discrepancies, (v − v')					..	..	..	..	..	..		..	− 01	+ 02	+ 01
Series 26	13 10 '76	5·29	6 47	+ 01	5	4 89	91	1 35	Not observed	SW	7	SW	12	H	2 97	3 16	2 97
	" "	30	48	+ 01	5	4 88	"	1 36		SW	12	SE	6	W	2 82	3 03	2 97
	" "	31	49	+ 01	5	4 87	"	1 37		SE	6	SSW	12	H	2 99	2 90	3 05
	" "	32	50	+ 01	5	4 86	"	1 38		SW	12	S	6	W	2 90	3 06	3·00
	" "	33	51	+ 01	5	4 85	"	1 39		S	5	SE	14	H	2 82	3 11	2 93
	" "	34	52	+ 02	5	4 84	"	1 40		SE	14	S	6	W	2 97	3·09	3 05
	" "	35	53	·00	5	4 83	"	1 41		S	8	S	6	H	2 91	3 08	3 08
δ	Range,	06	06	..	0	06	00	06	..	..	.	..	..	..	17	26	15
v	Means of 7	5 32	6 50	..	5	4 86	91	1 38	..	S 7				..	2 91	3·06	3·01
v'		Parabolic, (v)	..		..		..	..	..	..	..	..		..	2 94	3 01	3 01
Δ		Discrepancies, (v − v)					..	..	..	..	..	..		..	− 03	+ 05	00

TABLE XVIII.

CITIES PAST A VERTICAL.

CENTRAL VERTICAL.

and 1″ tin Tube-Rods].

6									7	8			9	
FACE VELOCITIES central vertical. is the mean of three observations.]								Rod velocity.	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations: Discharge/Depth	Mid-depth Velocity.	Rod Velocity Mean of 8 trials	DIFFERENCES $(v_R - U)$.	$(u - U)$
nal Depths (z)														
3	4	5	6	7	8	9	10	v_R	D	U	$v_{\frac{1}{2}R}$	u		
3·73	3·70	3·45	3·53	Not observed.	..	..	..	3·63	26·8	3·70	3·71	3·53	+·01	−·17
3·82	3·59	3·87	3·47		..	..	..	3·94	27·4	3·78	3·68	3·75	−·10	−·03
3·64	3·79	3·73	3·45		..	..	..	3·10	26·4	3·64	3·68	3·60	+·04	−·04
3·97	3·95	3·68	3·49		..	..	..	3·29	27·1	3·75	3·96	3·5	+·21	−·16
3·87	3·66	3·68	3·59		..	..	..	3·48	27·4	3·78	3·74	3·6	−·04	−·15
3·66	3·55	3·57	3·57		..	..	..	3·5	26·0	3·72	3·59	3·40	−·13	−·20
3·87	3·77	3·37	3·53		..	..	..	3·13	26·8	3·67	3·81	3·42	+·14	−·25
3·79	3·61	3·49	3·37		..	..	..	3·22	25·7	3·45	3·65	3·32	+·10	−·23
3·95	3·97	3·64	3·57		..	..	..	3·48	27·4	3·82	3·96	3·51	+·14	−·31
3·95	3·95	3·85	3·57		..	..	..	3·20	28·4	3·85	3·95	3·52	+·10	−·33
4·00	3·92	3·85	3·64		..	..	..	3·36	28·3	3·86	3·95	3·54	+·09	−·31
3·92	4·08	3·90	3·55		..	..	..	3·08	27·0	3·81	4·03	3·4	+·22	−·32
·36	·53	·53	·27	..	..	..	..	·76	2·0	·31	·44	·4	·35	·30
3·84	3·79	3·67	3·53	..	..	..	..	3·35	27·2	3·74	3·81	3·53	+·07	−·21
3·87	3·70	3·67	3·52	..	..	..	..	3·27	27·2	3·74	3·82	..	+·08	..
−·03	·00	·00	+·01	..	..	..	..	+·07	·0	·00	−·01	..	−·01	..
2·91	2·80	2·68	Not observed.	..	..	..	..	2·50	18·5	2·86	2·88	2·82	+·02	−·04
3·01	2·75	2·79		..	..	..	..	2·85	18·7	2·59	2·95	2·68	+·06	−·01
2·80	2·84	2·80		..	..	..	..	2·74	18·6	2·87	2·81	2·83	−·06	−·04
2·90	2·91	2·54		..	..	..	..	1·98	18·0	2·77	2·90	2·86	+·13	+·09
2·99	2·83	2·63		..	..	..	..	2·33	18·3	2·82	2·95	2·71	+·13	−·06
2·86	2·70	2·64		..	..	..	..	2·55	18·5	2·83	2·82	2·78	−·01	−·05
2·78	2·93	2·78		..	..	..	..	2·55	18·6	2·88	2·82	2·81	−·06	−·07
·23	·23	·26	..	..	..	..	..	·87	·8	·12	·14	·12	·19	·16
2·89	2·82	2·69	..	..	..	..	..	2·30	18·5	2·85	2·88	2·8	+·03	−·03
2·95	2·82	2·63	..	..	..	..	..	2·22	18·5	2·81	2·92	..	+·11	..
−·06	·00	+·06	..	..	..	..	..	+·35	+·2	+·04	−·04	..	−·05	..

SUBSURFACE AND MEAN VELO-

Soláni Embankment Main Site—

[*Instruments—1⅝" Double-Floats,*

Serial No.	Date 18	2 Depth Above Datum A	Actual H	Variation	Length of Rod, l	3 Fall of Water-Surface Upper 4 miles F₁	1 mile below Site F₂	Lower 4½ miles F₃	Local Slope S	4 Wind From Direction	Velocity	To Direction	Velocity	5 Timekeeper's Initial	Subsur past the (Each Velocity Nomi 0	1	2
Series 27.	16 10 '76	5 10	6 28	00	5	4 98	1 12	2 45	Not observed	..	0	..	0	W	3 26	3 30	3 14
	" "	10	28	− 01	5	"	"	"		..	0	..	0	H	3 19	3 33	3 30
	" "	09	27	− 01	5	4 99	"	2 44		..	0	..	0	W	3 19	3 39	3 41
	" "	·08	26	00	5	5 00	"	2 43		..	0	..	0	H	3 35	3 39	3 43
	" "	08	26	− 01	5	"	"	"		..	0	..	0	W	3 31	3 53	3 39
	" "	·07	25	00	5	5 01	"	2 42		..	0	..	0	H	3 37	3 24	3 41
	" "	·07	25	00	5	"	"	"		..	0	..	0	W	3 33	3 21	3 45
	" "	07	25	− 01	5	"	"	"		..	0	..	0	H	3 35	3·49	3 45
	"	06	24	00	5	5 02	"	2 41		..	0	..	0	W	3 45	3 55	3 39
	" "	06	24	− 01	5	"	"	"		..	0	..	0	H	3 49	3 41	3 33
	" "	05	23	− 01	5	5·03	"	2 40		..	0	..	0	W	3 30	3 31	3 41
	" "	04	22	00	5	5 01	"	2 39		..	0	N	7	H	3 51	3 30	3 41
	" "	·01	22	·00	5	"	"	"		N	7	N b E	5	W	3 34	3 41	3 41
	" "	04	22	− 01	5	"	"	"		N b E	5	N b E	5	H	3 41	3 30	3·09
	" "	03	21	00	5	5 03	"	2 38		N b E	8	N b E	6	W	3 21	3·43	3 37
	" "	03	21	− 01	5	"	"	"		N b E	6	N	8	H	3 33	3 30	3 37
δ	Range,	07	07	..	0	07	00	07	..	..	..	..	..	..	32	34	36
v	Means of 16	5·06	6 24	..	5	5 02	1 12	2 41	..	N 2				..	3·34	3·37	3 36
v'		Parabolic, (v) .				..	..	..	..	..	..	..		..	3 34	3 37	3 35
Δ		Discrepancies, (v − v') ..				..	..	.	..	..	..	..		..	00	00	+ 01
Series 28.	13 10 '76	5 09	6 27	+ 01	5	4 74	91	1 15	Not observed	..	0	..	0	P	2 78	2 94	2 65
	" "	10	28	+ 01	5	4·73	"	1 16		..	0	..	0	W	3 24	2 86	2 91
	" "	10	28	00	5	"	"	"		..	0	..	0	P	2 80	3 00	2 91
	" "	10	28	00	5	"	"	"		..	0	..	0	W	2 91	2 86	2 86
	" "	10	28	00	5	"	"	"		..	0	..	0	P	2 91	2 88	2 58
	" "	10	28	00	5	"	"	"		..	0	..	0	W	2 79	2 86	2 80
	" "	10	28	00	5	"	"	"		..	0	..	0	P	2 75	2 94	2 56
	" "	10	28	00	5	"	"	"		..	0	W b S	20	W	2 78	2 79	2 84
	12 10- "	4 88	·06	− 01	5	4·65	·90	1 10		ENE	12	ENE		H	2 79	2 78	2 73
	" "	87	·05	00	5	4·66	"	1 09		ENE	9	ENE	8	W	2 88	2 76	2 68
	" "	·87	05	− 01	5	"	"	"		ENE	8	E	10	H	2 67	2 64	2 80
	" "	·87	·05	+ 01	5	"	"	"		E	10	E	13	W	2 99	2 63	2 69
	" "	·87	03	− 01	5	"	"	"		E	13	E	11	H	2 88	2 ·9	2 75
	" "	86	·04	00	5	4 67	"	1 08		E	11	E	15	W	2 76	2 80	2 72
	" "	86	04	00	5	"	"	"		E	15	E	12	H	2 75	2 78	2 82
	" "	87	·05	+ 01	5	4 66	"	1·09		E	12	E	15	W	2 79	2 79	2 74
δ	Range,	24	24	..	0	09	01	08	..	..	..	..	..	..	57	37	35
v	Means of 16,	4·98	6·16	..	5	4·70	91	1 12	..	E 5				..	2·84	2·82	2 77
v'		Parabolic, (v') ..				..	..	..	..	..	..	..		..	2 84	2 82	2 77
Δ		Discrepancies, (v − v')				..	..	..	..	..	..	..		..	00	00	00

TABLE XIX.

CITIES PAST A VERTICAL

CENTRAL VERTICAL

and 1" tin Tube-Rods]

6 FACE VELOCITIES central vertical is the mean of three observations.] nal Depths (s) 3	4	5	6	7	8	9	10	Bed-velocity v_b	7 DISCHARGE past the vertical D	8 MEAN VELOCITY past the vertical Various Approximations Discharge / Depth U	Mid-depth Velocity $v_{\cdot 5}$	Rod Velocity (Mean of 3 trials) v	9 DIFFERENCES $(v_{\cdot 5} - \text{U})$	$(v - \text{U})$
3 11	3 14	2 94	Not observed	..	..	..	..	2 68	19 4	3 09	3 11	3 06	+ 02	− 03
3 31	3 30	3 09		..	..	..	..	2 82	20 2	3 21	3 [illegible]	2 82	+ 10	− 35
3 19	3 11	3 08		..	..	..	..	3 04	20 1	3 21	3 18	3 18	− 03	− 03
3·35	3 31	3 01		..	..	..	..	2 63	20·2	3·23	3 34	3 08	+ 11	− 15
3 53	3 33	3 09		..	..	..	..	2 ·9	20 7	3 30	3 50	3 24	+ 20	− 01
3 11	3 13	3 00		..	..	..	..	2 84	19 7	3 16	3 11	3 07	− 05	− 09
3 35	3 33	2 96		..	..	..	..	2 50	19·9	3 18	3 35	3 12	+ 17	− 06
3 21	3 13	3 16		..	..	..	..	3 20	20 6	3 28	3 20	3 19	− 08	− 09
3 31	3 06	3 13		..	..	..	..	3 22	20 [illegible]	3 29	3 28	3 11	− 01	− 18
3 26	3 23	3 00		..	..	..	..	2 71	20·0	3 21	3 26	3 [illegible]	+ 05	− 06
3 33	3 05	2 93		..	..	..	..	2 76	19 7	3 17	3 [illegible]0	[illegible]1	+ 13	00
3 13	3 09	3·03		..	..	..	..	2 96	19·4	3 19	3 13	3 23	− 06	+ 04
3 33	3 13	3 03		..	..	..	..	2 91	20 1	3 23	3 [illegible]	3 11	+ 08	− 12
3 28	3 39	3 01		..	..	..	..	2 55	19 [illegible]	3 16	3 29	3·08	+ 13	−·08
3 24	3 17	2 99		..	..	..	..	2 7	19 6	3 19	3 23	3 14	+ 04	− 05
3 30	3 13	3 24		..	..	..	..	3·3	20 4	3 29	3 28	3 02	− 01	− 2
42	34	31	..	..	..	..	..	8[illegible]	1 3	21	30	40	28	42
3·27	3 19	3·04	..	..	..	..	..	2 80	20·1	3 21	3 20	3 11	+ 03	− 1[illegible]
3 29	3 18	3 04	..	..	..	..	..	2 79	20 0	3 21	3 26	..	+ 07	..
− 02	+ 01	00	..	..	..	..	..	+ 01	+ ·1	00	− 02	..	− 02	..
2 68	2 50	2 46	..	..	..	..	..	2 41	16 [illegible]	2 63	2 65	2 61	+ 02	+ 0[illegible]
2 84	2 75	2 46	..	..	..	..	..	2 09	17 1	2 73	2 83	2 6	+ 10	− 06
2 65	2 68	2 52	..	..	..	..	..	2 32	17 [illegible]	2 71	2 65	2 62	− 06	− 08
2 65	2 68	2 51	..	..	..	..	..	2 2	16 8	2 68	2 65	2 6	− 03	− 01
2 68	2 63	2 52	..	..	..	..	..	2 38	16 [illegible]	2 70	2 67	2 59	− 03	− 11
2 62	2 83	2 54	..	..	..	..	..	2 1	16 8	2 68	2 65	2 72	− 03	+ ·04
2 75	2 73	2 58	..	..	..	..	..	1·9	16 [illegible]	2 60	2 75	2 7	+ 15	+ 1[illegible]
2 87	2 73	2 40	..	..	..	..	..	1 9	16 6	2 65	2 85	2 71	+ 20	+ 06
2 69	2 53	2 36	..	..	..	..	..	2 18	15 [illegible]	2 59	2 69	2 49	+ 10	− 10
2·51	2 53	2 29	..	..	..	..	..	2 04	15 4	2 54	2 53	2 53	− 01	− 01
2 61	2 37	2 43	..	..	..	..	..	2 4	15 [illegible]	2 57	2 60	2 41	+ ·03	− 16
2 67	2 32	2 37	..	..	..	..	..	2 42	15	2 56	2 66	2 45	+ 10	− 05
2 73	2 38	2 33	..	..	..	..	..	2 28	15 7	2 60	2 72	2 6	+ 12	+ ·0
2 70	2 41	2 36	..	..	..	..	..	2 34	15 [illegible]	2 59	2 69	2 49	+ 10	− 10
2 54	2 56	2 52	..	..	..	..	.	2 4	15 [illegible]	2 64	2 54	2 54	− 10	− 10
2 62	2 54	2 35	..	..	..	.	..	2 1[illegible]	15 [illegible]	2 58	2 62	2 41	+ ·04	− 1[illegible]
34	51	25	..	..	..	..	..	5[illegible]	1 [illegible]	19	32	3[illegible]	30	·29
2 65	2·37	2 42	..	..	..	..	..	2·24	16 [illegible]	2 63	2·67	2·5	+ ·04	− ·04
2 65	2 57	2 42	..	..	..	..	..	2 21	16 1	2 62	2 63	..	+ 06	..
00	00	·00	..	..	..	..	..	+ 0	+ 1	+ ·01	− ·01	..	− ·03	..

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments—1⅝″ Double-Floats,*

N B—The Actual Depth (H) on the vertical of Experiment is 0 5 of a foot

	1	2			3			4				5				
		DEPTH			FALL of Water-Surface			WIND.					SUBSURFACE past the sec- (Each Velocity is the			
								From		To			Nominal			
Serial No	Date, 1876 77	Actual. H	Variation.	Length of Rod *l*	Upper 3 miles F₁	Lower 4½ miles F₂	Local Slope S	Direction	Velocity.	Direction	Velocity	Timekeeper's Initial	0	1	2	3
Series 29.	21·3·'76	8·48	+ 05	8	5 72	5 03	190	..	0	..	0	H	2 31	2 78	2 59	2 68
	" "	50	00	8	5 80	5 05	"	..	0	..	0	W	2 31	2 58	2 68	2 83
	25·3· "	·48	00	8	5 77	5·03	?	..	0	SSW	5	H	2 34	2 54	2 68	2 54
	"	·48	00	8	"	"	?	SSW	5	SSW	5	W	2 59	2 78	2 68	2 69
	24·3· "	·47	+ 07	8	5 73	5 04	?	·	0	SSW	14	W	2 34	2 63	2 68	2 54
	22 3· "	·45	·00	8	5 80	5 00	?	..	0	·	0	H	2 27	2 88	2 31	2 88
	" "	45	00	8	"	"	?	..	0	..	0	W	2 46	2 54	2 68	2 59
	23·3· "	41	+ ·03	8	5 79	4 96	?	..	0	S	12	H	2 46	2 54	2 54	2 65
	20 3· "	33	+ 05	8	5 77	4 93	?	SW	5	S	10	H	2 31	2 27	2 63	2 68
	" "	38	+ 05	8	5·87	4 98	?	S	10	..	0	W	2 05	2 73	2 59	2 73
	27·3· "	·35	+ 10	8	5 90	4 95	?	..	0	..	0	W	2 50	2 68	2 27	2 78
	28·3· "	35	00	8	5 85	4 95	?	..	0	N	15	H	2 24	2 50	2 31	2 59
	29 3· "	30	00	8	5 80	4 80	?	·	0	..	0	W	2 03	2 34	2 42	2 42
	" "	30	00	8	"	"	?	..	0	..	0	H	2·43	2 50	2 63	2 54
	27·3 "	28	+ 05	8	5 82	4 88	?	..	0	..	0	H	2 31	2 43	2 73	2 63
	17·3 "	28	00	8	5 82	4 83	?	..	0	SW	14	W	2 50	2 59	2 83	2 54
δ	Range,	22	..	0	·15	25	?	..	..	..	.	..	54	61	56	46
v	Means of 16,	8 39	..	8	5 8[illegible]	4 95	?	SSW 2				..	2 34	2 60	2 58	2 64
v′		Parabolic, (v′)	..	..	..	..	..	..	..	..	..	..	2 39	2 51	2 60	2 66
Δ		Discrepancies (v − v′)			..	..	..	..	..	..	..	..	− 05	+ ·09	− ·02	− 02
Series 30.	27 3·'77	7·07	− 01	7	5 83	4 02	Not observed	NW	4	N	[illegible]	P	2 46	2 61	2 70	2 86
	" "	·06	00	7	5·84	4·01		N	[illegible]	N	[illegible]	W	2 42	2 70	2 75	2 75
	26·3· "	6 87	00	7	5 88	3 87		N	[illegible]	N	[illegible]	W	2 50	2 63	2 [illegible]8	2 86
	" "	89	+ 03	7	5 86	3 89		N	1	NE	[illegible]	P	2 50	2 86	2 63	2 78
	" "	·90	·00	7	5 90	3 90		NE	4	NW	4	W	2 24	2 94	2 70	2 80
δ	Range,	20	..	0	07	15	..	..	..	..	.	..	26	33	15	·11
v	Means of 5,	6 96	..	7	5·86	3 94	..	N 1				..	2 42	2 75	2 71	2 81
v′		Parabolic, (v′)	..	..	..	..	..	..	..	..	..	.	2 46	2 65	2·77	2 83
Δ		Discrepancies, (v − v′)			..	..	..	..	..	..	..	..	− 04	+ 10	− 06	− 02

CITIES PAST A VERTICAL

TABLE XX.

NON-CENTRAL VERTICAL

and 1" tin Tube-Rods]

less than the central depth shown by the Gauge see *Pla* XVI

6 VELOCITIES vertical of Experiment. mean of three observations. Depths (z) 4	5	6	7	8	9	10	Bed velocity. v_b	7 DISCHARGE past the vertical D	8 MEAN VELOCITY past the vertical, Various Approximations. Discharge/Depth U	Mid-depth Velocity $v_{\frac{1}{2}H}$	Rod Velocity Means of 8 trials. u	9 DIFFERENCE $(v_{\frac{1}{2}H} - U)$	$(u - U)$
2 73	2 83	2 68	2 78	2 46	..	..	2 31	22 8	2 69	2 75	2 80	+ 06	+ 11
2 83	2 94	3 00	2 88	2 77	..	..	2 6	24 1	2 84	2 90	2 88	+ 06	+ 04
2 68	2 83	2 68	2 50	2 68	..	..	2 7	22 2	2 62	2·72	2 88	+ 10	+ 26
2 63	2 88	2 73	2·73	2 50	..	..	2 39	23 0	2 71	2 69	2 88	− 02	+ 17
2 54	2 83	2 59	2 68	2 50	..		2 43	22 2	2 62	2 61	2 80	− 01	+ 15
2 78	3 06	2 78	2 83	2 46	..	..	2 29	22 1	2 61	2 84	2 80	+ 23	+ 19
2 68	2 63	2 46	2 88	2 42	..	..	2 21	22 1	2 61	2 67	2 88	+ 06	+ 27
2 78	2 73	2 59	3 00	2 42	..	..	2 18	22 4	2 66	2 77	2 86	+ 11	+ 20
2 59	2 78	2 78	2 46	2 59	..	.	2 6	21 4	2 56	2 62	2·94	+ 06	+ 38
2 50	2 63	2 59	2 59	2 54	.	..	2 52	21 9	2 61	2 52	2·65	− 09	+ 01
2 83	2 59	2 73	2 73	2 54		..	2 4	22 2	2 65	2 79	2 80	+·14	+ 15
2 59	2 38	2 68	2 78	2 46	..	..	2 3	21·0	2 51	2 55	2 7	+ 04	+ 22
2 49	2 73	2 59	2 83	2 50	..	..	2 39	21 2	2 55	2 61	2 80	+ 05	+ 25
2 78	2 6	2 73	2 63	2 54	.	..	2 51	21	2 59	2 67	2 8	+ 08	+ 24
2 78	2 68	2 68	2 59	2 46	..	..	2 43	21 4	2 59	2 68	2 75	+ 09	+ 16
2 83	2 73	2 68	2 68	2 54	..	.	2 30	22 0	2 66	2 82	2 65	+ 10	− 01
38	68	34	54	31	..	..	59	3 1	33	38	·29	32	39
2 69	2 68	2 62	2 72	2 52	.	..	2 44	22 1	2 63	2 70	2 81	+ ·07	+ 15
2 69	2 70	2 67	2 62	2 56	..	..	2 50	21 9	2 61	2 70	..	+ 09	..
00	− 02	− 05	+ 10	− 02	..	..	− 06	+ 2	+ 02	00	..	− 02	..
2 89	2 75	2 63	2 46	..	..	..	2 44	19·2	2·71	2·88	2 73	+·17	+·07
2 80	2 73	2 61	2 68	..	..	..	2 68	19	2 71	2 77	2·90	+·06	+ 25
2 78	2 70	2 65	2 17	..	..	..	2 17	18 4	2 68	2 82	2 9	+ 14	+ 23
2·91	2 86	2 56	2 65	..	..	..	2·66	19 1	2 77	2 84	2 9	+ ·07	+ 20
2 63	2 36	2 80	2 75	..	..	..	2 79	19 4	2·80	2 72	3 00	− 09	+ 20
·28	16	24	58	..	..	..	·58	1·0	12	·16	2	25	·23
2 80	2·79	2 66	2 54	..	..	..	2·54	19·0	2 73	2 81	2 92	+ ·05	+ 19
2 83	2 76	2 64	2 46	..	..	..	2 46	18·9	2·71	2 83	..	+ 12	..
− 03	+ 03	+ 02	+ ·08	..	..	..	+ 08	+ 1	+ 09	− 02	..	− 04	..

41' 7⅝ LEFT OF CENTRE,
i.e. 7½' from Left Bank

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments* { *Nos* 31 *and* 32. 1½" *Double-Floats,*
{ *No.* 32. 3" *Double-Floats,*

	1	2			3			4				5				
		DEPTH			FALL of Water-Surface.			WIND					SUBSURFACE past the ver [Each Velocity is the Nominal			
								From		To						
Serial No	Date 18 6	Actual	Variation	Length of Rod	Upper 5 miles	Lower 4½ miles	Local Slope	Direction.	Velocity	Direction	Velocity	Timekeeper's Initial				
		H		l	F_1	F_2	S						0	1	2	3
Series 31.	1 3-'76	8 58	00	8	5 82	4 73	?	..	0	..	0	W	2 65	2 97	3 06	2 88
	" "	58	00	8	5 77	"	?	..	0	..	0	H	2·83	3 00	2 97	2 97
	" "	58	00	8	"	"	?	..	0	..	0	W	2 94	3 09	2 97	3 03
	" "	58	00	8	"	"	?	..	0	.	0	H	2 91	2 73	2 91	2·88
	8 3 "	43	00	8	5 77	4 43	190	..	0	..	0	W	2 70	2 80	3 06	2 94
	" "	43	00	8	"	"	"	..	0	.	0	H	2 59	2 97	2 85	2 91
	" "	43	00	8	"	"	"	..	0	..	0	W	2 70	2 78	2 88	3 06
	" "	43	00	8	"	"	"	..	0	8	7	H	2 88	2 78	3 05	2 80
	2 3 "	40	00	8	5 80	4 60	?	.	0		0	W	2 56	2 94	2 94	2 80
	" "	40	00	8	"	"	?	..	0	..	0	H	2 80	2 75	2 75	2 78
	" "	40	+ 03	8	"	"	?	..	0	..	0	W	2 65	2 94	2 78	3 00
	" "	43	+ 03	8	5 82	4 63	?	.	0	..	0	H	2 50	2 86	2 80	2 88
	" "	45	00	8	5 80	4 65	?	..	0	..	0	W	2 59	2 97	3·06	3 06
	6-3 "	35	00	8	5 75	4 55	?	..	0	..	0	H	2 80	2 75	3·06	2·86
	" "	85	00	8	"	"	?	..	0	..	0	W	2 70	3 03	3 13	3 03
	" "	85	00	8	5 85	"	?	..	0	..	0	H	2 73	2 83	3 13	2 97
δ	Range,	23	..	0	10	·30	?	..	..	..		..	44	36	38	28
v	Means of 16	8 45	..	8	5 79	4 59	?		S l			.	2 72	2 80	2 96	2 93
v		Parabolic, (v)	..	..	..	..	..	..	..			..	2 74	2 85	2 94	2 99
Δ		Discrepancies, (v − v')	..	..	..	..	..	..	..			..	− 02	+ 04	+ 02	− 06
Series 32.	8 2 '76	8 75	00	8	5 85	4 75	?	..	0	..	0	W	3 13	3 30	3 23	3 33
	" "	75	00	8	"	"	?	..	0	.	0	H	3 00	3 23	3 45	3 26
	23-2- "	·65	00	8	5 75	4·75	?	..	0	..	0	W	3 33	3 30	3 49	3 33
	" "	·65	00	8	"	"	?	..	0		0	H	2 91	3 23	3 30	3 49
	" "	65	00	8	5 85	"	?	..	0	..	0	W	3 26	3 19	3 45	3 41
	" "	65	00	8	"	"	?	..	0	..	0	H	3 06	3 09	3 19	3 45
	" "	65	00	8	"	"	?	..	0	..	0	W	3 37	3 30	3 37	3 53
	29 2- "	65	00	8	5 80	4 75	?	..	0	..	0	W	3 00	3 19	3 41	3 61
	" "	·65	00	8	"	"	?	..	0	..	0	H	2 97	3 06	3 13	3 45
	26 2- "	60	00	8	5 60	4 70	190	..	0	..	0	H	2 88	3 00	3 26	3 41
	" "	60	00	8	"	"	"	..	0	..	0	W	3·19	2 97	3 26	3 19
	" "	60	00	8	"	"	"	..	0	..	0	H	2 83	3 06	3·19	3 49
	" "	·60	00	8	"	"	"	..	0	..	0	W	3 00	3 19	3 49	3 49
	28-2- "	60	00	8	5 80	4·70	?	8	4	8	4	H	3·06	3 41	3 13	3 30
	" "	60	00	8	"	"	?	8	4	..	0	W	2 97	3 49	3·45	3 45
	" "	60	00	8	"	"	?	..	0	..	0	H	3 13	3·45	3 26	3 41
δ	Range,	15	..	0	·10	05	?	..	.	..	.	..	54	·52	·30	42
v	Means of 16,	8·64	..	8	5·81	4 73	?		S l			..	3 07	3 22	3·32	3·41
v'		Parabolic, (v)	..	..	..	..	..	..	..			..	3 07	3 22	3 32	3 38
Δ		Discrepancies, (v − v)	..	..	..	..	..	..	..			..	00	00	00	+ 03

CITIES PAST A VERTICAL. **TABLE XXI.**

NON CENTRAL VERTICALS

and 1″ tin Tube-Rods, except on 8-2-'76
and 1″ wood Rods on 8-2-'76. }]

6								7	8			9		
VELOCITIES tical of Experiment mean of three observations Depths (z)							Bed velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical Various Approximations. $\frac{\text{Discharge}}{\text{Depth}}$	Mid depth Velocity.	Rod Velocity Mean of 6 trials	DIFFERENCES		
4	5	6	7	8	9	10	v_H	D	U	$v_{\frac{1}{2}d}$	u	$(v_{\frac{1}{2}d} - U)$	$(u - U)$	
3·06	2·97	2·97	2·80	2·63	..	..	2·57	24·8	2·89	3·03	3·06	+·14	+·17	41¼ LEFT OF CENTRE.
3·13	3·03	3·16	3·06	2·73	..	..	2·54	25·6	2·99	3·10	3·11	+·11	+·12	
3·03	3·19	2·86	2·91	2·88	..	..	2·86	25·8	3·01	3·08	3·13	+·07	+·12	
2·88	2·80	3·16	2·86	2·68	..	..	2·58	24·4	2·84	2·86	2·90	+·02	+·06	
2·91	3·03	3·03	2·86	2·70	..	..	2·6	24·2	2·90	2·94	2·9	+·04	+·03	
3·00	2·91	2·94	3·00	2·38	..	..	2·11	24·2	2·87	2·98	3·00	+·11	+·13	
3·03	3·09	3·06	2·94	2·65	..	..	2·53	24·7	2·93	3·04	3·01	+·11	+·08	
3·00	2·97	2·97	2·91	2·70	..	..	2·61	24·3	2·88	2·99	3·06	+·11	+·18	
3·09	2·77	2·80	2·54	2·65	..	..	2·69	23·7	2·82	3·07	2·9	+·25	+·12	
2·94	2·86	2·80	2·94	2·73	..	..	2·65	23·7	2·82	2·92	2·86	+·10	+·04	
3·03	3·00	3·00	2·83	2·75	..	..	2·75	24·6	2·91	3·02	2·78	+·11	−·13	
2·97	3·19	2·88	3·00	2·91	..	..	2·87	24·7	2·93	3·02	2·99	+·09	+·06	
2·83	3·00	2·97	3·03	2·83	..	..	2·74	23·1	2·97	2·91	2·99	−·06	+·02	
3·13	3·13	3·03	3·06	2·65	..	..	2·51	24·6	2·95	3·13	2·80	+·18	−·15	
2·91	3·13	2·86	3·09	2·78	..	..	2·67	24·1	3·00	2·95	2·9	−·03	−·07	
2·94	2·91	2·83	2·88	2·63	..	..	2·54	24·1	2·89	2·93	2·9	+·04	+·06	
·25	·30	·36	·55	·33	..	..	·70	2·1	·20	·27	·3	·31	·33	
3·00	3·01	2·96	2·92	2·71	..	..	2·61	24·6	2·91	3·00	2·97	+·09	+·06	
3·01	3·00	2·95	2·88	2·77	..	..	2·71	24·6	2·91	3·01	..	+·10	..	
−·01	+·01	+·01	+·04	−·06	..	..	−·10	·0	·00	−·01	..	−·01	..	
3·26	3·23	3·41	3·26	3·13	..	..	3·0	28·5	3·26	3·25	3·5	−·01	+·27	40 LEFT OF CENTRE [illegible]
3·33	3·26	3·16	3·19	3·06	..	..	2·96	28·	3·22	3·30	3·3	+·08	−·1	
3·53	3·41	3·37	3·13	3·06	..	..	3·01	28·0	3·31	3·49	3·17	+·18	−·14	
3·41	3·30	3·37	3·19	3·06	..	..	2·98	28·	3·27	3·37	3·30	+·10	+·03	
3·30	3·33	3·41	3·26	3·06	..	..	2·9	28·4	3·29	3·31	3·43	+·02	+·14	
3·37	3·37	3·37	3·33	3·00	..	..	2·79	28·2	3·26	3·37	3·24	+·11	−·02	
3·53	3·23	3·26	3·06	3·13	..	..	3·18	28·6	3·29	3·43	3·41	+·14	+·12	
3·45	3·53	3·37	3·33	3·19	..	..	3·1	29·2	3·37	3·48	3·35	+·11	−·02	
3·30	3·37	3·19	3·06	3·13	..	..	3·1	27·8	3·21	3·32	3·31	+·11	+·10	
3·23	3·30	3·19	3·09	2·94	..	..	2·8	27·9	3·16	3·25	3·31	+·09	+·15	
3·37	3·23	3·45	3·13	2·94	..	..	2·8	28·3	3·32	3·33	3·41	+·01	+·09	
3·23	3·30	3·19	2·97	3·00	..	..	3·02	27·	3·17	3·25	3·45	+·08	+·28	
3·45	3·33	3·33	3·09	3·09	..	..	3·0	28·	3·28	3·41	3·41	+·13	+·13	
3·37	3·45	3·41	3·26	3·03	..	..	2·89	28·	3·29	3·39	3·3	+·10	+·01	
3·45	3·57	3·49	3·26	3·13	..	..	3·05	29·	3·39	3·49	3·4	+·10	+·05	
3·41	3·49	3·41	3·41	3·09	..	..	2·90	28·9	3·37	3·43	3·43	+·06	+·06	
·30	·34	·33	·44	·25	..	..	·32	3·0	·23	·24	·36	·17	·4	
3·37	3·36	3·34	3·19	3·07	..	..	2·9	28·5	3·28	3·37	3·3	+·09	+·0	
3·40	3·38	3·31	3·20	3·06	..	..	2·94	28·3	3·27	3·40	..	+·13	.	
−·03	−·02	+·03	−·01	+·01	..	..	+·05	·0	+·01	−·03	..	−·04		

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments* { *No* 33 1⅝" *Double-Floats,*
{ *No* 34. 3" *Double Floats,*

	1	2			3			4				5				
Serial No	Date 1875 76	Depth		Length of Rod.	Fall of Water-Surface.			Wind				Timekeeper s Initials	SUBSURFACE past the ver Each Veloc y is the Nominal			
		Actual	Variation		Upper 5 miles	Lower 4½ miles	Local Slope.	From		To						
								Direction	Velocity	Direction	Velocity					
		H		l	F_1	F_2	S						0	1	2	3
Series 33.	27-3-'76	8 70	00	8	5 85	4 67	190	W	4	S	16	G	3 09	3 66	3 45	3 61
	28-3	70	00	8	5 90	4 70	?230	N b W	4	V	1	P	3 26	3 09	3 45	3 37
	,,	70	00	8	,,	,,		V	1	..	0	G	3 45	3 35	3 45	3 49
	23 2 76	68	+ 05	8	5 82	4 78	?	SW	6	S	15	H	3 09	3 26	3 45	3 41
	20 2 ,,	65	00	8	5 85	4 75	?	.	0	S	6	W	3 09	3 26	3 13	3 19
	,, ,,	65	00	8	,,	,,	?	S	5	S	17	H	2 88	3 13	3 33	3 19
	25 3 76	63	00	8	5 87	4 63	190	W	6	NW	3	G	3 41	3 53	3 45	3 45
	,, ,,	63	00	8	,,	,,		NW	3	..	0	P	3 41	3 41	3 80	3 45
	,, ,,	63	00	8	,,		19		0	.	0	G	3 41	3 45	3 57	3 57
	26 3	6.	00	8	5 88	4 62	19		0	S	0	P	3 37	3 49	3 57	3 55
	28 3 ,,76	60	00	8	5 80	4 70	?	.	0	S	5	W	3 06	3 41	3 49	3 33
	,,	60	00	8			?	S	5	SW	4	H	3 00	3 23	3 16	3 55
	18 4 ,,76	53	00	8	5 84	4 53	200	..	0		0	P	2 75	3 00	3 16	3 23
	,, ,,	52	− 03	8	5 88	4 52	,,		0	V	1	R	2 94	3 26	3 41	3 37
	,,	50	00	8	5 90	4 50	,,	V	1	..	0	P	3 19	3 33	3 53	3 66
	,,	50	·00	8	,,	,,	,,	..	0	V	1	R	2 91	3 45	3 49	3 49
δ	Range,	20	.	0	10	23	?166	..		.		..	70	66	07	47
v	Means of 16	8 62		8	5 86	4 64	?224	SSW 3				..	3 14	3 33	3 43	3 43
v'		Parabolic (v)				..	.	..		.			3 15	3 29	3 39	3 46
Δ		Discrepancies (v−v')					..	..		..		.	− 01	+ 04	+ 04	− 03
Series 34.	10-1 ,,76	9 33	+ 05	9	5 77	5 33	Not observed	S	14	S	15	W	3 37	3 66	3 97	3 87
	,,	55	00	9	5 75	5 35		S	15	S	21	H	3 66	3 61	3·95	3 73
	11 1	45	00	9	5 75	5 25		V	8	SE	8	W	3 55	3 73	3 92	4 00
	,,	45	00	9	5 80	,,		SE	8	S	15	H	3 41	3 70	3 75	3 70
	14-1 ,,	43	00	9	5 77	5 23			0	N	5	H	3 49	3 77	3 80	3 95
	,, ,,	43	00	9	,,			N	9	S	20	W	3 53	3 97	3 90	3 97
	7 1 ,,	40	00	9	5 80	5 30		..	0	NE	6	H	3 75	3 70	3 90	3 82
	12 1 ,,	40	00	9	5 80	5 20		..	0		0	W	3 70	3 90	3 82	3 8.
	,,	40	00	9	,,	,,		V	1	S b W	8	H	3 53	3 75	3 92	3 82
		40	00	9	,,			S b W	8	S b W	1	W	3 64	3 77	3 68	3 90
	15 1 ,,	40	00	9	5 80	5 20		..	0	..	0	H	3 51	3 64	3 61	3 68
	,, ,,	40	00	9	,,	,,			0	V	4	W	3 47	3 75	3 87	3 97
	,, ,,	40	00	9	,,			V	4	N	17	H	3 37	3 64	3 85	3 77
	17 1	40	00	9	5 80	5 20		..	0	..	0	W	3 55	3 75	3 80	3 92
	6-1 ,,	35	00	9	5 85	5 25		V	1	V	1	H	3 26	3 64	3 87	3 90
	,, ,,	35	00	9	,,	,,		V	1	V	1	W	3 49	3 70	3 85	3 85
δ	Range,	·20		0	10	15	..	.		..	.		49	36	36	32
v	Means of 16,	9 42	.	9	5 80	5 24	..	S 4				..	3 52	3 73	3·84	3 85
v'		Parabolic, (v')			..	..		..	..	..		..	3 55	3 70	3 31	3 86
Δ		Discrepancies, (v−v')			..	..		..	..	..		..	− ·03	+ 03	+ ·03	− 01

CITIES PAST A VERTICAL **TABLE XXII.**

NON-CENTRAL VERTICALS.

and 1" Rods of wood in 1876, of tin in 1878
and 1" wood Rods }]

6 VELOCITIES tical of Experim nt mean of three observe ons) Depths (z) 4	5	6	7	8	9	10	Bed velocity v_B	7 DISCHARGE past the vertical D	8 MEAN VELOCITY past the vertical Various Approximations Discharge / Depth U	Mid depth Velocity u_H	Rod Velocity Mean of 3 trials ρ	9 DIFFERENCES $(u_H - U)$	$(ρ - U)$	
3 49	3 49	3 41	3 53	3 37		..	3 26	30 4	3 50	3 49	3 49	− 01	− 01	40′ LEFT OF CENTRE. see also Series 32
3 33	3 57	3 49	3 49	3 45	..	..	3 42	29 5	3 39	3 41	3 4	+ 02	+ 04	
3 61	3 45	3 49	3 41	3 33	..	..	3 27	29 8	3 43	3 55	3 57	+ 12	+ 14	
3 33	3 33	3 37	3 26	3 06	.	..	2 92	28 5	3 29	3 3	3 41	+ 04	+ 12	
3 37	3 33	3 30	3 49	3 37	.	..	3 29	28	3 30	3 43	3 3	+ 13	+ 07	
3 26	3 13	3 06	3 13	3 0	.	..	2 90	27	3 15	3 33	3 14	+ 07	− 01	
3 53	3 53	3 41	3 57	3 61	..	.	3 64	30 3	3 51	3 53	3 5	+ 02	+ 04	
3 2	3 33	3 66	3 66	3 66	..	..	3 66	30 3	3 51	3 26	3 4	− 25	− 04	
3 45	3 90	3 53	3 66	3 41	..	..	3 2	30	3 57	3 59	3 33	+ 02	− 21	
3 3	3 41	3 37	3 1	3 70	.	..	4 0	29 7	3 44	3 35	3 3	− 09	− 09	
3 49	3 37	3 33	3 23	3 19	.	.	3 17	28 7	3 3	3 45	3 41	+ 12	+ 06	
3 41	3 41	3 49	3 33	3 26	.	..	3 22	28	3 34	3 41	3 3	+ 07	− 01	
3 41	3 53	3 57	3 33	3 37	..	..	3 39	28 0	3 29	3 44	3 53	+ 15	+ 21	
3 53	3 49	3 4	3 41	3 20	..	..	3 18	28 7	3 37	3 52	3 43	+ 15	+ 06	
3 49	3 66	3 49	3 53	3 19	..		3 02	29 6	3 48	3 53	3 5	+ 05	+ 09	
3 57	3 49	3 37	3 57	3 23	..	..	3 06	29	3 44	3 55	3 3	+ 11	− 05	
38	77	60	53	67	..	..	1 15	3	42	37	45	40	40	
3 44	3 45	3 42	3 43	3.34	..	..	3 20	29	3 40	3 44	3 42	+ 04	+ 02	
3 49	3 40	3 45	3 37	3 26	..	..	3 1	29 1	3 38	3 40	..	+ 11	..	
− 05	− 04	− 03	+ 06	+ 08	..	..	+ 12	+ 2	+ 02	− 05	..	− 07	..	
3 70	3 75	3 66	3 57	3 47	3 19	..	3 04	34 6	3 64	3 74	3 65	+ 10	+ 01	37½′ LEFT OF CENTRE
3 75	4 17	3 85	3 76	3 49	3 51	..	3 57	35 8	3 75	4 08	3 65	+ 33	− 10	
3 8	3 68	3 70	3 55	3 43	3·16	..	3 04	34 6	3 66	3 73	3·69	+ 07	+ 03	
3 61	3 7	3 64	3 75	3 53	3 45	..	3 41	34	3 65	3 73	3 66	+ 08	+ 03	
4 05	4 00	3 68	3 55	3 33	3 30	..	3 29	35	3 71	4 01	3 6	+ 30	− 10	
3 85	3 75	3 64	3 57	3 37	3 23	..	3 1	34 8	3 69	3 8	3 74	+ 09	+ 05	
4 00	3 85	3 92	3 64	3 49	3 13	..	2 90	35	3 72	3 89	3 7	+ 17	+ 05	
3 68	3·92	3 66	3 75	3 41	3 39	..	3 38	34	3 72	3 85	3 68	+ 13	− 04	
3 73	3 75	3 68	3 49	3 3	3 26	..	3 3	34	3 64	3 74	3 6	+ 10	+ 03	
3·82	3 85	3 87	3 77	3 45	3 19	..	3 09	34 8	3 70	3 84	3 71	+ 14	+ 01	
3 80	3 70	3 77	3 64	3 33	3 30	..	3 29	33	3 61	3 73	3·65	+ 12	+ 04	
3 9	3 70	3 64	3 51	3 4	3 14	..	3 02	34 4	3 66	3 78	3 66	+ 12	00	
4 11	3 75	3 64	3 66	3 25	3 41	..	3 46	34	3 68	3·86	3 51	+ 18	− 1	
3 92	3 82	3 64	3 57	3 39	3 19	.	3 11	34	3 6	3 85	3 71	+·18	+·04	
4·05	3 97	3 57	3 61	3 57	3 37	..	3 30	34 5	3 72	4·00	3 73	+ 28	+ 01	
3 80	3 70	3·85	3 53	3 66	3 23	..	3·04	34 4	3·63	3 73	3·77	+·05	+ 0	
50	49	35	28	35	·38	..	53	1	10	·35	26	·23	·26	
3 86	3 82	3 71	3 61	3 44	3 28	..	3·21	34 7	3 68	3 83	3·65	+ 15	·00	
3 87	3 83	3 75	3 81	3 43	3 21	..	3 10	34·6	3·67	3·35	..	+ 18	..	
−·01	− 01	− 04	00	+·01	+·07	..	+·11	+ 1	+·01	−·02	..	−·03	..	

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments—3′ Double Floats,*

Serial No	1	2			3			4				5				
	Date 18 6	Depth		Length of Rod	Fall of Water-Surface			Wind				Timekeeper's Initial	Subsurface past the ve[Each Velocity is the			
		Actual	Variation		Upper 5 miles	Lower 4½ miles	Local Slope	From		To			Nominal			
								Direction	Velocity	Direction	Velocity					
		H		l	F_1	F_2	S						0	1	2	3
Series 35	18 1 76	9 63	− 05	9	5 77	5 43	?	S b W	6	NW	10	W	4 03	4 22	4 41	4 08
	, ,	60	00	9	5 75	5 40	?	NW	10	SW	14	H	4 20	4 22	4 29	4 26
	,,	58	− 05	9	5 77	5 38	?	SW	14	SW	18	W	4 11	4 20	4 35	4 20
	8 5 ,,	40	+ 06	9	5 85	5 25	205		0	.	0	H	4 29	4 29	4 48	4 32
δ	Range	23	.	0	10	18	?	..		.			26	09	19	24
v	Mean of 4	9 55		9	5 79	5 37	?	WSW 7				.	4 16	4 23	4 38	4 22
v		Parabolic, (v)		..		..		..	.	..			4 18	4 24	4 28	4 28
Δ		Discrepancies, (v − v)				.			..				− 02	− 01	+ 10	− 06
Series 36	19 1-'76	9 43	00	9	5 82	5 23	?	..	0	SW	5	H	3 90	4 20	4 26	4 35
	,, ,,	42	− 03	9	5 78	5 22	?	SW	5	SW	9	W	4 17	4 22	4 29	4 17
	,, ,,	40	00	9	5 80	5 20	?	SW	9	S	10	H	4 14	4 38	4 20	4 38
	17 1 ,	40	00	9	5 80	5 20	?	..	0	..	0	H	4 11	4 20	4 32	4 29
	,, ,,	40	00	9	,	,,	?	..	0	S	9	W	4 20	4 26	4·20	4 22
	,, ,,	40	00	9		,,	?	S	9	S b W	14	H	3 90	4 17	4 26	4 08
	5 5 ,,	30	00	9	5 85	5 20	205	..	0	..	0	W	4 02	4 38	4 38	4 35
	, ,,	30	00	9	,,	.	,,	..	0	..	0	H	4 05	4 22	4 22	4 58
	6-5- ,,	30	00	9	5 85	5 20	205	..	0	..	0	W	4 20	4 61	4 48	4 29
	,, ,,	30	00	9	.	,,	190	..	0	..	0	H	4 35	4 29	4 55	4 41
	22 1- ,,	30	00	9	5 80	5 20	?	V	l	V	l	W	4 26	4 22	4 22	4 11
	,, ,,	29	− 02	9	5 81	5 19	?	V	l	V	l	H	4 32	4 11	4 17	4 17
	,, ,,	28	00	9	5 82	5 18	?	V	8	S	20	W	3 92	4 14	4 29	4 26
	24-1- ,,	25	00	9	5 75	5 15	?	..	0	SW	0	H	4·08	4 00	4 11	4 05
	,, ,,	25	00	9	5 80	,,	?	SW	5	NW	21	W	4 14	4 05	4 08	4 17
δ	Range	·18		0	10	10	?	..	..	..	.	..	45	61	47	53
v	Means of 15	9 33	..	9	5 81	5 20	?	SW b S 3				.	4 13	4 23	4·27	4 26
v′		Parabolic, v)			.	..	.	..		..		..	4 16	4 21	4 23	4 23
Δ		Discrepancies, (v − v)			..	.		..		..		.	− 03	+ 02	+ 04	+ 03

TABLE XXIII.

CITIES PAST A VERTICAL

NON-CENTRAL VERTICAL,

and 1" wood Rods]

6								7	8			9	
VELOCITIES tical of Experiment. mean of three observations] Depths (*s*)							Rod velocity	DISCHARGE past the vertical	MEAN VELOCITY past the vertical. Var ous Approximations: Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 8 trials	DIFFERENCES $(v_{\frac{1}{2}} - U)$	$(u - U)$
4	5	6	7	8	9	10	v_m	D	U	$v_{\frac{1}{2}}$	u		
4 38	4 00	4 08	3 87	4 05	3 70	..	3 48	39 3	4 08	4 07	3 77	− 01	− 38
4 22	4 14	4 20	4 03	3 73	3 75	..	3 70	39 3	4 09	4 16	3 9	+ 07	− 12
4 14	4·05	3 97	3 73	3 75	3 47	..	3 3	38 2	3 99	4 07	3 8	+ 08	− 14
4 41	4 22	4 32	4 06	4 11	3 92	..	3 84	39	4 24	4 28	4 1	+ 04	− 19
·27	22	35	33	38	45	..	53	1	25	21	45	09	20
4·29	4 10	4 14	3·92	3 91	3 71	..	3 60	39	4 10	4·15	3 9	+ 05	− 18
4 25	4 19	4 10	3 99	3 84	3 66	..	3 35	39 1	4 09	4 21	..	+ 12	..
+ 04	− 09	+ 04	− 07	+ 07	+ 05	..	+ 05	+ 1	+ 01	− 06	..	− 07	..
4 03	4 17	4 05	3 82	3 55	3 55	..	3 55	37 7	3 99	4 13	3 85	+ 14	− 14
4 14	4 05	3 92	3 82	3 64	3 68	..	3 70	37 7	4 01	4 08	3 86	+ 07	− 15
4 20	3 95	3 90	3 75	3 64	3 64	.	3 64	37 7	4 01	4 02	4 05	+ 01	+ 04
4 05	4 17	3 95	3 85	3 64	3 49	.	3 47	37 7	4 01	4 13	3 87	+ 12	− 14
4 32	3 97	3 92	3 68	3 68	3 57	.	3 57	37 6	4 00	4 07	3 87	+ 07	− 13
4 22	4 00	3 92	3 87	3 66	3 66	..	3 66	37 5	3 99	4 07	3 92	+ 08	− 07
4 20	4 22	4 30	3 90	3 92	3 82	..	3 79	38 7	4 16	4 21	4 12	+ 05	− 04
4 29	4 35	4 48	4 03	4 08	4 20		4 24	39 5	4 5	4 3	4 24	+ 08	− 01
4 58	4 26	4 14	4 00	3 87	3 87		3 8	39	4 25	4 37	4 04	+ 12	− 21
4 29	4 29	4 35	4 00	4 26	3 95	.	3 86	39 7	4 27	4 29	4 12	+ 02	− 15
3 97	3 85	3·90	3 82	3 59	3 43	..	3 38	36 6	3 93	3 89	3 85	− 04	− 06
4 05	4 03	4 07	3 64	3 55	3 61	.	3 67	36 7	3 95	4 04	3 92	+ 09	− 03
4·08	3 81	4 08	3 80	3 75	3 70	..	3 69	37 1	3 99	3 95	3 81	− 04	− 12
3 95	3 85	3 80	3 68	3 59	3 73	.	3 71	3 8	3 87	3 89	3 79	+ 02	− 08
3 97	4·14	3 92	3 97	3 70	3 59		3 56	36 8	3 97	4 08	3 88	+ 11	− 09
63	50	58	39	71	77	..	86	3 9	40	48	45	18	25
4 15	4 08	4 04	3 84	3 74	3 70	..	3 65	37 8	4 04	4 10	3 95	+ 06	− 09
4 19	4 12	4 02	3 90	3 74	3 56	.	3 49	37	4 04	4 15	..	+ 11	..
− 04	− 04	+ 02	− 06	00	+ 14	..	+ 20	+ 1	00	− 05	..	− 05	..

30' LEFT OF CENTRE.
see also Series 37.

SUBSURFACE AND MEAN VELO-

SOLANI RIGHT AQUEDUCT—

[*Instruments—3" Double-Floats,*

Serial No.	Date 1876	Depth: Actual H	Depth: Variation	Length of Rod l	Fall of Water-Surface: Upper 5 miles F₁	Fall of Water-Surface: Lower 4½ miles F₂	Local Slope S	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Timekeeper's Initial	Subsurface- past the (Each Velocity is the Nominal 0	1	2	3
	1	2			3			4				5				
Series 37.	27-1 '76	9 05	00	9	5 80	5 00	Not observed.	..	0	..	0	H	4·03	4 03	4 22	4 11
	" "	05	00	9	5 85	"		..	0	..	0	W	4 14	4 22	4 22	4 14
	" "	05	00	9	"	"		..	0	S	10	H	4 03	4 03	4 00	3 95
	" "	05	00	9	"	"		S	10	S	12	W	4 08	4 08	3·90	4 08
	28 1· "	05	00	9	5 75	5·05		..	0	SW	6	H	4 11	4 17	4 08	3 93
	" "	05	00	9	5 85	"		SW	8	..	0	W	4 14	4 14	4 11	4 26
	" "	05	00	9	"	"		.	0	..	0	H	4 29	4 08	4 08	4 08
	" "	05	00	9	"	"		..	0	S	12	W	4 00	4 08	4 05	3 95
	29 1· "	03	00	9	5 82	4 98			0	..	0	H	4 14	4 22	4 11	4 20
	" "	03	00	9	5 87	"		..	0	.	0	W	4 14	4 32	4 44	4 05
	" "	03	00	9	"	"		.	0	SW	7	H	4 17	4 17	4 20	4 22
	" "	03	00	9	"	"		SW	7	SW	6	W	4 20	4 26	4 29	4 17
	31 1· "	8 95	00	9	5 75	4 95		..	0	..	0	H	4 29	4 22	4 03	4 08
	" "	95	00	9	5 85	"		..	0	..	0	W	4 26	4 08	4 17	4 05
	" "	95	00	9	"	"		..	0	..	0	H	4 08	4 08	4 20	3 97
	" "	95	00	9	"	"		..	0	..	0	W	4 03	4 14	4 20	4 05
	1-2- "	90	00	9	5 80	4 90		..	0	..	0	H	3 95	4 20	4 08	4 14
	" "	90	00	9	5 85	"		..	0	S	19	W	4 00	4 17	4 05	4 38
δ	Range,	15	..	0	12	15	..	..		..		.	34	20	54	46
v	Means of 18,	9 01	..	9	5 84	4 98	..	S b W 3				..	4 12	4 15	4 14	4 10
v′		Parabolic, (v′)			..	..		..	..	..		..	4 13	4 14	4 14	4 11
Δ		Discrepancies, (v – v′)				..		..	..	..		..	– 01	+ 01	00	– 01
Series 38.	16 2-'76	9 10	00	9	5 80	5 10	Not observed.	..	0	..	0	H	3 70	3 73	3 77	3 75
	" "	10	00	9	"	"		..	0	.	0	W	3 70	3 87	3 70	3 92
	" "	10	00	9	"	"		..	0	..	0	H	3 80	3 70	3 61	3 80
	" "	10	00	9	"	"		..	0	..	0	W	3 66	3 82	3 70	3 77
	3-2- "	15	00	9	5 75	5 15		V	10	S	9	H	3 92	3 92	4 00	4 08
	" "	15	00	9	6 05	"		S	9	S	20	W	3 82	4·00	4·07	4 03
	17-2 "	15	00	9	5 75	5 05		..	0	..	0	H	3 37	3 73	3 70	3 85
	" "	18	+ 05	9	5 92	5 08		..	0	..	0	W	3 53	3 47	3 90	3 77
	" "	20	00	9	5 90	5 10		..	0	..	0	H	3 49	3 64	3 85	3·85
	" "	23	+ 05	9	5 87	5 13		..	0	S	0	W	3 57	3 59	3 70	3 80
	" "	25	00	9	5 85	5 15		S	8	S	[illegible]	H	3 57	3 73	3 75	3 73
	" "	28	+ 05	9	5 82	5 18		S	9	S	11	W	3 43	3 80	4 00	3 82
δ	Range,	18	..	0	30	13	..	..	-	..	-	..	55	53	42	35
v	Means of 12,	9 17	..	9	5 84	5 12	..	S 4				..	3 63	3 75	3 81	3 85
v		Parabolic, (v)			..	..		..	..	..		.	3 63	3 75	3 83	3 87
Δ		Discrepancies, (v – v)				..		.	..	..		..	00	00	– 02	– 02

CITIES PAST A VERTICAL

TABLE XXIV.

NON-CENTRAL VERTICALS

and 1″ wood Rods]

6								7	8			9		
VELOCITIES vertical of Experiment (mean of three observations) Depths (z)							Bed velocity.	DISCHARGE past the vertical	MEAN VELOCITY past the vertical — Various Approximations: Discharge / Depth	Mid-depth Velocity	Rod Velocity Mean of 4 trials	DIFFERENCES		
4	5	6	7	8	9	10	v_n	D	U	$v_{\frac{1}{2}n}$	u	$(v_{\frac{1}{2}} - U)$	$(u - U)$	
405	408	366	387	368	345	..	344	357	395	407	369	+ 12	− 26	30′ LEFT OF CENTRE see also Series 35, 36
408	408	381	385	368	353	..	352	366	404	422	367	+ 18	− 37	
411	405	353	364	366	359	..	359	351	388	408	368	+ 20	− 20	
397	387	377	373	364	347	..	346	350	387	392	369	+ 05	− 18	
400	390	395	405	368	361	..	361	358	396	395	371	− 01	− 25	
405	400	392	361	380	366	.	36	35[illegible]	397	402	365	+ 05	− 32	
411	414	405	380	368	366	.	366	361	399	413	386	+ 14	− 13	
408	392	366	380	361	366	..	366	35[illegible]	389	400	374	+ 11	− 15	
408	414	403	359	373	368	..	368	361	399	411	368	+ 12	− 31	
391	403	395	382	377	364	..	364	364	403	400	379	− 03	− 24	
414	435	385	382	368	366	..	366	365	404	425	392	+ 21	− 12	
411	395	400	380	361	355	..	355	362	401	403	383	+ 02	− 18	
400	400	382	364	370	357	..	351	352	393	400	374	+ 07	− 19	
411	385	375	370	355	351	..	351	350	391	399	374	+ 08	− 17	
408	390	392	382	364	355	..	355	353	394	399	381	+ 05	− 13	
392	387	395	373	364	351	..	351	351	392	398	390	− 02	− 02	
403	395	380	375	385	353	..	353	352	396	399	365	+ 03	− 33	
400	385	387	355	359	366	..	360	348	391	393	385	+ 02	− 06	
46	50	52	50	30	23	..	24	18	17	35	29	24	35	
407	4·00	385	375	368	358	..	358	356	396	403	375	+ 07	− 21	
406	398	389	377	362	346	.	346	356	395	402	..	+ 07	..	
+ 01	+ 02	− 04	− 02	+ 06	+ 12	..	+ 12	0	+ 01	+ 01	..	00	..	
390	370	377	353	359	341	..	359	336	370	379	349	+ 09	− 21	30′ RIGHT OF CENTRE see also Series 33
368	385	380	357	345	319	..	316	330	369	377	365	+ 08	− 01	
387	366	373	345	339	333	..	332	330	363	375	361	+ 12	+ 04	
385	387	375	370	345	341		341	338	372	366	359	+ 14	− 13	
400	382	385	373	353	341	..	339	357	383	390	366	+ 07	− 17	
403	385	405	364	347	343	.	345	352	385	393	371	+ 08	− 14	
400	387	355	353	359	317	.	311	337	368	392	355	+ 24	− 13	
380	377	380	366	359	321	..	314	337	368	378	356	+ 10	− 10	
400	397	373	359	370	353	.	350	346	376	398	361	+ 22	− 15	
397	387	373	377	359	349		347	34[illegible]	373	391	364	+ 18	- 09	
395	392	359	382	355	337	..	332	345	373	393	370	+ 20	− 03	
387	381	380	347	335	328	..	326	31[illegible]	370	387	365	+ 17	− 06	
35	31	50	37	35	36	..	39	22	22	23	22	17	25	
391	384	376	362	352	335	..	835	341	373	387	36[illegible]	+ 14	− 10	
387	384	377	366	351	333	.	329	341	372	386	..	+ 14	.	
+ 04	00	− 01	− 04	+ 01	+ 02	..	+ 04	0	+ 01	+ 01	..	00	..	

SUBSURFACE AND MEAN VELO-

SOLÁNI RIGHT AQUEDUCT—

[*Instruments—3" Double-Floats,*

Serial No	1	2			3			4				5	SUBSURFACE past the vertical (Each Velocity is the			
	Date 18 6	DEPTH		Length of Rod.	FALL of Water-Surface.			WIND				Timekeeper's Initial.	Nominal			
		Actual	Variation		Upper 5 miles	Lower 4½ miles.	Local Slope.	From		To			0	1	2	3
								Direction	Velocity	Direction	Velocity					
		H		l	F_1	F_2	s									
Series 39.	2 2 '76	8 85	00	9	5 85	4 95	Not observed	..	0	..	0	H	3 80	3 95	4 00	4 05
	" "	85	00	9	"	"		..	0	SW	11	W	3 92	4 00	3·95	4 08
	" "	85	00	9	"	"		SW	11	SW	10	H	3 87	3 80	3 95	4 05
	" "	85	00	9	"	"		SW	10	S	10	W	4 14	3 97	4 03	3 85
δ	Range	00	..	0	00	00	..	..		..	,	..	34	20	08	23
v	Means of 4	8 85	..	9	5 85	4 95	..	SW b S 7				.	3 93	3 93	3·08	4·01
v	Parabolic, (v′)			..	..	..		..		..		.	3 91	3 97	4 00	4 00
Δ	Discrepancies, (v − v′)			..		..		..		..		..	+ 02	− 04	− 02	+ 01
Series 40.	15 2-'76	8 80	00	8	5 80	4 90	Not observed.	.	0	..	0	H	3 16	3 17	3 41	3 35
	" "	80	00	8	"	"		NW	6	..	0	W	3 19	3 35	3 41	3 41
	14-2 "	70	00	8	5·70	4 80		..	0	..	0	W	3 08	3 33	3 45	3 41
	" "	70	00	8	"	"		..	0	..	0	H	3 08	3 47	3 47	3 52
	" "	70	00	8	5 80	"		E	7	E	9	W	3 31	3 33	3 49	3 39
	" "	70	00	8	"	"		E	9	E	10	H	3 06	3 41	3 30	3 37
	" "	70	00	8	"	"		E	10	SE	18	W	3 14	3 37	3 39	3 35
	11 2- "	·70	00	8	5 80	4 70		..	0	SW	0	W	3·09	3 24	3 33	3 45
	" "	70	00	8	"	"		SW	6	SW	12	H	3 05	3 45	3 31	3 35
	" "	70	00	8	"	"		SW	12	S b W	19	W	2·97	3 39	3 33	3 37
	10-2- "	65	00	8	5 85	4 65		..	0	..	0	H	3·23	3 53	3 41	3 49
	" "	·65	00	8	5 90	"		..	0	SW	5	W	3 31	3 35	3 57	3 30
	" "	·65	00	8	"	"		SW	5	V	10	H	3 13	3 23	3 39	3 49
	12 2- "	60	00	8	5 80	4·65		SW	4	..	0	H	3 05	3 35	3 30	3 39
	" "	60	00	8	"	"		..	0	S	1	W	3 14	3 21	3 41	3 35
	" "	60	00	8	"	"		S	5	SW	12	H	3 06	3 31	3 30	3 37
δ	Range	20	..	0	20	25	..	..	..	..	.	..	34	30	27	22
v	Means of 16,	8 68	..	8	5 80	4 76	..	S 3				..	3 13	3 34	3 39	3 40
v′	Parabolic, (v′)			..	..	..		..		..		..	3 16	3·29	3 38	3 42
Δ	Discrepancies, (v − v′)			..		..		..		..		..	− 03	+ 05	+ 01	− 02

TABLE XXV.

CITIES PAST A VERTICAL

Non Central Verticals

and 1" *wood Rods*]

6								7	8			9		
Velocities of Experiment. mean of three observations]. Depths (z)							Rod velocity	Discharge past the vertical	Mean Velocity past the vertical. Various Approximations			Differences		
									Discharge / Depth	Mid depth Velocity	Rod Velocity Mean of 4 trials			
4	5	6	7	8	9	10	v_R	D	U	$v_{½D}$	u	$(v_{½D} - U)$	$(u - U)$	
3·95 4 08 3 95 4 05	3 87 3 97 3 95 3 80	3 77 3 95 3 92 3 75	3 70 3 75 3 57 3 59	3 55 3 59 3 68 3 59	3 45 3 37 3 53 3 43	. .. .	3 45 3 3 3 53 3 43	33 9 34 4 33 9 33·9	3 83 3 89 3 84 3 83	3 92 4 03 3 95 3·94	3 66 3 64 3 66 3 68	+ 09 + 14 +·11 + 11	− 17 − 25 − 16 −·13	30 Right of Centre. see also Series 38
13	17	20	18	13	16	..	16	5	06	11	04	05	10	
4·01	3 90	3 85	3 65	3 60	3 45	..	3 45	34 0	3 85	3 96	3 66	+ 11	− 19	
3 97	3 91	3 83	3 71	3 57	3 43	..	3 43	34 2	3 86	3 95	..	+ 09	..	
+ 04	− 01	+ 02	− 06	+ 03	+ 02	.	+ 02	− 2	− 01	+ 01	..	+ 02	..	
3 45 3 41 3 35 3·39 3 45 3 39 3 49 3 53 3 51 3 24 3 61 3 47 3 51 3 33 3 31 3 26	3 23 3 30 3·45 3 24 3 41 3 26 3 21 3 47 3 28 3 24 3 43 3 14 3 45 3 43 3 43 3 37	3 24 3 24 3 26 3 45 3 35 3 06 3 26 3 33 3·23 3 30 3 14 3 31 3 26 3 39 3 30 3 30	3 24 3 03 3 24 3·26 3 06 3 11 3·16 3 13 2 91 3·01 3 19 3 17 3 05 3 09 3 14 3 14	3 08 2 83 3 05 3 14 3·03 2 88 3 01 2 94 3 08 2·97 2 90 3 23 3 03 2 96 2·88 3·00	. . ..	.. ..	2 9 2 67 2 92 3 06 3 01 2 72 2 90 2 81 3 20 2 94 2 71 2 27 3 02 2 88 2 72 2 92	28 6 28 4 28 8 29 1 28 7 28 0 28 3 28 5 28 3 28 0 28 6 28 5 28 4 28 1 28 0 28 0	3 24 3.22 3 30 3 35 3 30 3 22 3 26 2 28 3 25 3 22 3 33 3 29 3 29 3 27 3 25 3 25	3 36 3 57 3 59 3 54 3 44 3 34 3 39 3 51 3 43 3 24 3 55 3.36 3 49 3 36 3 35 3 29	3 31 3 46 3 41 3 35 3 41 3 18 3 35 3 38 3 51 3 34 3 33 3 32 3 41 3 47 3 36 3 32	+ 12 + 15 + 09 − 01 + 14 + 12 + 13 + 23 + 18 + 02 + 22 + 07 + 20 + 09 + 10 + 04	+ 07 + 24 + 11 00 + 11 − 04 + 09 + 10 + 06 + 12 00 + 03 + 12 + 20 + 11 + 07	37½ Right of Centre
37	33	39	35	40	..	..	60	1 1	·13	31	29	24	25	
3 42	3 33	3 28	3 12	3·00	..	..	2·92	28 4	3 27	3 39	3·30	+ 12	+ 0	
3 42	3 37	3 27	3 13	2 94	.	..	2 79	28 3	3 26	3 40	..	+ 14	..	
00	− 04	+ 01	− 01	+ 06	..	..	+ 13	+ 1	+ 01	− 01	.	− ·02	..	

SUBSURFACE AND MEAN VELO-

SOLÁNI EMBANKMENT MAIN SITE—

[*Instruments—1⅝" Double-Floats,*

	1	2				3				4				5			
		DEPTH				FALL of Water-Surface.				WIND					SUBSUR past the ver (Each Velocity homl		
										From		To					
Serial No	Date, 1877 78	Above Datum	Actual	Variation	Length of Rod	Upper 4 miles	1 mile below Site	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity	Timekeeper's Initial			
		A	H		l	F_1	F_2	F_3	S						0	1	2
															FOR SERIES 41,		
Series 42.	21 11-'77	9·74	5 74	+ 01	3	4 79	1·21	5 35	?	..	0	SW	9	G	3 53	3 41	3 45
	8 1- „	62	62	+ ·02	5	4 71	1 19	5 30	223	..	0	W	10	P	3 37	3 33	3·26
	12 8-'76	·65	·65	00	3	5·08	1·07	5 25	216	E	10	E	12	P	3 57	3 57	3 33
	„ „	65	65	00	3	„	„	„	„	E	8	E	8	R	3 41	3 37	3 41
	„ „	65	65	00	3½	„	„	„	„	E	8	E	5	P	3 47	3 55	3·49
	19-11- „	·60	60	·00	5	4 83	1 22	5 15	213	,	0	W	6	R	3 57	3 66	3 45
	„ „	60	60	00	5¹	,	1 19	5 16	„	W	8	SW	5	P	3 57	3 61	3 45
	„ „	60	60	00	5	„	1 17	3·20	213	SW	5	W	7	R	3 49	3 57	3 41
	18-11- „	57	57	00	5₂	4 86	1 14	3 20	205	..	0	SSE	7	P	3 57	3 49	3 49
	„ „	57	57	− 01	5	„	„	„	„	SSE	7	SE	10	R	3·30	3 49	3 26
	„ „	58	58	+ 03	5¹	4 85	1 15	„	213	SE	10	SE	12	P	3 06	3 41	3 30
	13-8- „	57	57	+ 03	5	5 16	1·07	3 17	200	E	11	E	17	R	3 33	3 49	3 49
	10 1-'77	54	34	− 01	5	4 69	1 26	3 25	216	..	0	E	6	W	3 45	3 45	3·09
	„ „	53	55	+ 02	5	4 65	1·27	5 25	„	E	6	E	17	P	3 26	3 50	3 41
	1-12- „	48	48	+ 01	5	4·75	1 25	5 13	?	W	5	W	5	P	3 23	3 41	3 33
	„ „	48	48	− 01	5	„	„	„	?	W	5	S	6	G	3 30	3 23	3 13
δ	Range,	26	26	..	50	48	20	22	?02	..	..	..	..	..	51	43	40
v	Means of 16,	9 59	5 60	..	5 41	4 86	1 17	3 22	?213	SE b E 9				..	3 40	3 46	3·36
v	Parabolic, (v)													..	3 42	3 42	3 39
Δ	Discrepancies, (v − v)													..	− 02	+ 04	− 03
Series 43	18-1-'77	7 80	3 30	+ 01	3½	4 63	1 39	3·93	?	W b S	9	W b S	9	P	2 54	2 50	2 50
	„ „	80	80	00	3½	„	„	„	?	W b S	9	W b S	18	W	2 83	2 73	2 68
	23-1 „	·79	·79	00	3½	4 64	1 36	4·00	3 25	..	0	..	0	P	2 48	2 50	2 50
	13-1 „	70	·70	00	3	4 63	1 37	3 90	2 33	W	4	..	0	W	2 75	2 73	2 50
	„ „	69	·69	− 02	3	4 64	„	3 69	„	..	0	S	7	P	2 78	2 63	2 54
	„ „	68	68	− ·01	3	4 65	„	3 58	„	S	7	S b E	4	W	2 54	2 65	2 54
	22 1- „	59	59	+ 01	3¹	4 54	1 36	3 90	3 25	..	0	..	0	P	2 58	2 46	2 59
	„ „	59	59	·00	3	„	„	„	„	..	0	S	5	W	2 59	2 59	2 50
	„ „	58	58	− 02	3½	4 55	„	3 89	„	S	9	..	0	P	2 46	2 56	2 44
	„ „	57	57	00	3½	4 56	„	3 98	?	..	0	S	0	W	2·61	2 46	2 50
	16-1- „	50	50	00	3	4 63	1 37	3 80	?	E	7	E	0	P	2 80	2 56	2 52
	„ „	50	50	00	3	„	„	„	?	E	6	E	5	W	2 68	2 75	2 73
	„ „	50	50	·00	3	„	„	„	?	E	5	E	3	P	2 54	2 59	2 46
	„ „	50	·50	·00	3	„	„	„	?	E	3	E	10	W	2 75	2 73	2 50
	15-1- „	49	49	00	3	4 64	1 36	3 50	?	SE	9	SE	10	P	2 54	2 59	2 56
	„ „	49	49	+ 01	3	„	„	„	?	SE	10	S	7	W	2 75	2 68	2 44
δ	Range,	31	31	..	50	11	03	20	?	..	..	..	..	..	42	·29	·29
v	Means of 14,	7·61	3·61	..	3 31	4·61	1 37	3 57	?	S b E 3				..	2 66	2·61	2 53
v′	Parabolic, (v′)													..	2 66	2 62	2 52
Δ	Discrepancies, (v − v′)													..	00	− 01	+ 01

CITIES PAST A VERTICAL

TABLE XXVI

Non Central Vertical

a d 1 t n Tube-Rods]

6									7	8			9	
FA 2 VELOCITIES ticalo z perim a th mean three beervail na nal D p hs								D d ve ocl y	D SCHARGE pas the vert a	MEAN VELOC TY past the vertical Va ons App ox ma ns Discha ge / Dep h	A d d p h Ve ocl y	Rod Ve oc y Mean of 6 rials	D FFERENCE $(v_M - U)$	$(u - U)$
2	4	5	6		8	9	10	v_M	D	U	v_{6H}	u		
SEE PAGE 56														
3 30	3 19	2 94						2 7	18	3 26	3 32	3 01	+ 06	− 25
3 49	3 26	3 06						2 94	18 4	3 28	3 45	3 00	+ 17	28
3 16	2 95	2 88						3·3	18 1	3 20	3 19	2 9	01	41
3 6	3 16	3 09						3 04	18 3	3 25	3 20	3 06	− 05	− 19
3 9	3 45	3 4						3 4	19	3 40	3 24	3 14	16	− 26
3 57	3 53	3 49						3 4	9 8	3 54	3 55	3 23	+ 01	− 31
3 49	3 41	3 33						3 28	19 4	3 46	3 48	3 17	+ 02	− 29
3 53	3 23	3 33						3 39	19	3 42	3 5	3 33	+ 09	19
3 66	3 33	2 81						2 5	18	3 36	3 62	3·02	+ 26	− 34
3 45	3 03	2 88						2	17	3 27	3 41	3·0	+ 19	1
3 23	3 6	3 09						3·05	18 0	3 22	3 24	2 88	+ 02	− 34
3 4	3 9	3 30						3 36	18 8	3 38	3 43	3 05	+ 05	− 33
2 97	3·33	3 0						2 3	17 5	3 11	2 99	2 75	− 12	36
3 03	3 06	3 9						3 20	17 8	3 21	3 11	2 86	10	35
3 03	3 19	3 06						3·00	17 6	3 20	3 11	2 9	− 09	23
3 26	3 6	3 06						3 0	17 4	3 18	3 23	3 0	+ 05	17
69	62	79						1 16	2 4	43	63	48	42	24
8 31	8 2	3 10						3 0	18 4	3 9	3 32	3 01	+ 03	25
3 33	3 22	3 09						2 95	18 4	3 29	3 34		+ 05	
− 02	00	+ 02						+ 05	0	00	− 02		− 02	
2 54								2 5	9 6	2 5	2 50	2 49	− 01	02
2 3								2 0	9	2 56	2 68	2 44	+ 12	− 1
2 0								1 78	8·9	2 34	2 50	2 34	+ 16	00
2 42								2 36	9	2 57	2 53	2 39	04	18
2 29								2 12	9 2	2 50	2 55	38	+ 05	12
2 44								2 3	9 3	2 53	2 55	2 5	+ 02	− 02
2 42								2 32	9 0	2 51	2 57	2 34	+ 06	1
2 42								2 3	9·0	2 52	2 52	2 23	00	29
2 36								2 3	8 8	2 46	2 47	2 2	+ 01	25
2 36								2 28	8 8	2 45	2 49	2 30	+ 04	15
2 36								2 28	8 8	2 53	2 53	2 3	00	16
2 38								2 20	9 2	2 63	2 73	2 4	+ 10	− 2
2 21								2 08	8 6	2 44	2 49	2 38	+ 05	− 06
2 27								2 15	8	2 54	2 55	2 38	+ 01	16
2 36								2 26	8 8	2 5	2 57	2 52	+ 06	+ 01
2 38								2 35	6 8	2 53	2 50	2 4	− 03	11
44								73	1 1	29	26	31	20	30
2 3								[illegible]	9 1	2 51	2 55	2·3	+ ·04	− 13
2 36								2 23	9 1	2 51	2 54		+ 03	
01								00	0	00	+ 01		+ 01	

CENTRE OF LOWEST STEP LEFT BANK

1¢ 7¾ LEFT OF CENTRE

SUBSURFACE AND MEAN VELO-

Soláni Embankment Main Site—

[*Instruments—1$\frac{5}{8}$" Double-Floats,*

Series 44, 45 46 —The velocity parabola is carried down only to level of Tread of lowest Step : so that

Serial No.	1	2				3				4				5	SUB past the ver		
		Depth				Fall of Water-Surface.				Wind					[Each Velocity		
										From		To			Nomi		
	Date 1877-'9.	Above Datum	Actual	Variation	Length of Rod	Upper 4 miles	1 mile below Site	Lower 4 miles	Local Slope	Direction	Velocity.	Direction.	Velocity	Timekeeper's Initial			
		h	H		l	F_1	F_2	F_3	S						0	1	2
Series 44	7-4-'77	8 55	8 93	− 02	8	4 58	1 24	4 68	?	N	5	SE	10	W	2 88	2 73	2 91
	6 4 ,,	43	81	00	8	4·60	1 20	4 65	?	NE	6	NNE	6	P	2 86	2·91	2 54
	13-3- ,,	40	·78	+ 01	8	4 63	1 17	4 65	?	W	7	NE	12	W	2 91	2 80	2 83
	10-3- ,,	3[illegible]	73	+ 04	8	4·68	1 22	3 55	?	W	7	NE	[illegible]	P	2 94	2 73	3·00
	2-4-'79	29	·65	00	8	4 54	1 20	4 50	225	W	[illegible]	..	0	A	2 54	2 78	2 65
δ	Range.	26	28	.	0	14	09	1 13	?	..		.		..	40	·18	46
v	Means of h,	8 40	8 78	.	8	4 61	1 22	4 41	?	NE *b* N 3				.	2 83	2 70	2 70
v'		Parabolic, (v), *down to level of 12th Step,*													2 62	2 82	2 76
Δ		Discrepancies, (v − v)													+ 01	− 03	+ 03
Series 45.	5-4-'77	8 19	8 57	− 04	8	4 39	1 26	4 40	220	..	0	E	21	W	2 65	2 65	2 78
	17 3- ,,	15	53	− 03	8	4 63	1 22	4 40	220	..	0	W	15	W	2 78	2 59	2 54
	21-3- ,,	12	·50	+ 04	8	4 61	1 21	4 38	?	[illegible]	7	NE	11	W	2 80	2 86	2 73
	22 3 ,,	·09	47	+ 02	8	4 54	1 21	4 35	?	W	9	W	12	P	2 68	2 70	2 75
	,, ,	·09	47	− 02	8	,,	,,	,,	?	W	13	W	12	W	2 68	2 75	2 73
	23-3 ,,	·00	38	00	8	4 63	1 20	4 27	?	W	6	W	[illegible]	P	2 63	2 63	2 40
δ	Range	19	19	..	0	09	06	13	?	..	..	..	.	..	·17	27	38
v	Means of h,	8 11	8 49	..	8	4 59	1·22	4 36	?	WNW 4				..	2 70	2·70	2 66
v'		Parabolic, (v'), *down to level of 12th Step,*													2 70	2 70	2 67
Δ		Discrepancies, (v − v)													00	00	− 01
Series 46	16-3-'77	7 92	8 30	00	8	4 61	1 29	4·20	?	NW	12	NW	15	P	2 59	2 61	2 48
	19-3- ,,	87	2[illegible]	− 03	8	4 56	1 24	4 20	?	E	7	E	2	P	2 73	2 59	2 56
	24-3- ,,	82	20	− 02	8	4 61	1 29	4 10	?	W	5	..	0	W	2 70	2 75	2 54
	,, ,,	·79	17	− 05	8	4 64	,,	4·07	?	..	0	W	5	P	2 56	2 61	2 61
	23-3- ,,	·80	18	00	8	4 58	1 32	4 05	210	W	7	..	0	W	2 6[illegible]	2 65	2 54
	31-3- ,,	·80	·18	+ ·03	8	4 58	1 32	4·0[illegible]	?	SW	5	W	14	P	2 59	2 50	2 46
	2-4- ,,	74	·12	+ ·02	8	4 64	1 21	4 15	21[illegible]	..	0	E	10	W	2 70	2 56	2 63
	,, ,,	75	·13	·00	8	4 63	,,	4 16	,,	E	10	..	0	P	2 50	2 44	2 53
δ	Range.	18	·18	..	0	08	·14	13	?	..	..	..	..	..	·23	31	17
v	Means of h,	7 81	8 19	..	8	4·61	1·27	4 12	?	NNW 1				..	2 63	2 59	2 54
v'		Parabolic, (v'), *down to level of 12th Step,*													2 63	2 59	2 33
Δ		Discrepancies, (v − v')													00	·00	+ 01

CITIES PAST A VERTICAL.

TABLE XXVII.

NON-CENTRAL VERTICAL

and 1" tin Tube-Rods]

the quantities v_M D U $v_{\frac{1}{2}D}$ are not computed for it, not being comparable with those of the Observation Curve

6									7	8			9	
SURFACE VELOCITIES tical of Experiment. is the mean of three observations)								Bed velocity	DISCHARGE past the vertical.	MEAN VELOCITY past the vertical. Various Approximations			DIFFERENCES	
nal Depths (z)										Discharge / Depth	Mid-depth Velocity.	Rod Velocity Mean of 3 trials		
3	4	5	6	7	8	9	10	v_M	D	U	$v_{\frac{1}{2}D}$	u	$(v_{\frac{1}{2}D} - U)$.	$(u - U)$
2 73	2 34	2 39	2 33	2 36	2 27	..	..	2 19	22 4	2 51	2 36	2 34	− 15	− ·17
2 63	2 46	2 36	2 40	2 41	2 33	..	..	2 26	22 3	2 53	2 42	2 33	− 11	− 20
2 63	2 50	2 42	2 34	2 48	2 38	..	..	2 30	22 5	2 56	2 47	2 40	− 09	− 16
2 54	2 38	2 59	2 47	2 29	2 21	..	..	2 15	22 1	2 53	2 46	2 43	− 07	− 10
2 56	2 34	2 44	2 38	2 52	2 46	..	..	2 42	21 9	2 53	2 37	2 31	− 16	− 22
19	·16	·23	·14	23	25	..	..	·27	6	05	11	12	09	12
2 62	2 40	2 44	2 35	2 41	2 33	..	..	2·20	22 2	2 53	2 42	2 30	− 11	− ·17
2 62	2 42	..	..	..	..	..	..	..	..	..	..	..	..	..
·00	− ·02	..	..	..	..	..	..	..	..	..	..	..	..	..
2 68	2 40	2 31	2 34	2 21	2 31	..	..	2 37	21 2	2 47	2 42	2 41	− 05	− 06
2 50	2 46	2 38	2 24	2 24	2 31	..	..	2 35	20 7	2 43	2 44	2 44	+ 01	+ 01
2 73	2 50	2 29	2 31	2 44	2 33	..	..	2 27	21 7	2 55	2 45	2 38	− 10	− 17
2 52	2 42	2 33	2 50	2 46	2 48	..	..	2 49	21 4	2 52	2 40	2 41	− 12	− 11
2 78	2 52	2 34	2 27	2 46	2 27	..	..	2 16	21 6	2 54	2 48	2 35	− 06	− 19
2 46	2 40	2 42	2 43	2 26	2·04	..	..	1 96	20 2	2 41	2 40	2 36	− 01	− 05
32	12	·13	·26	25	44	..	..	·53	1 5	·14	06	09	·13	·20
2 61	2 40	2 35	2 35	2 35	2 29	..	..	2 27	21 1	2 49	2 43	2 39	− 06	− 10
2 59	2 48	..	..	..	..	..	..	..	..	..	..	..	..	..
− 02	− ·02	..	..	..	..	..	..	..	..	..	..	..	..	..
2 36	2 17	2 36	2 14	2 13	2 13	..	..	2 13	19 4	2 33	2 20	2 25	− 13	− 08
2 36	2 40	2 22	2 46	2 38	2 34	..	..	2 33	20 0	2 42	2 38	2 42	− 04	00
2 44	2 42	2 34	2 36	2 21	2 11	..	..	2 09	20 0	2 43	2 41	2 33	− 02	− ·10
2 56	2 46	2 17	2 29	2 59	2 29	..	..	2 24	20 0	2 43	2 43	2 29	00	− 14
2 48	2 36	2 14	2 26	2 24	2 17	..	..	2 16	19 4	2 38	2 34	2 26	− 04	− 12
2 46	2·63	2 26	2 16	2 24	2 36	..	..	2 38	19 5	2 39	2 60	2 35	+ 21	− 04
2 65	2 44	2 34	2 27	2 44	2 17	..	..	2 14	20 1	2 48	2 43	2 32	− 05	− 16
2 42	2 40	2 19	2 08	2 42	2 00	..	..	1·95	19 1	2 35	2 39	2 24	+ 06	− 11
29	46	22	38	·46	36	..	..	·43	1 0	15	·40	·16	31	·16
2 44	2 41	2 25	2 25	2 33	2 20	..	..	2 18	19 7	2 40	2 40	2 31	·00	− ·05
2 45	..	..	..	..	..	..	..	..	..	..	..	..	..	..
− 01	..	..	..	..	..	..	..	..	..	..	..	..	..	..

6 INCHES FROM THE 4' DROP-WALL, LEFT BANK,
i.e. 74'½ LEFT OF CENTRE.

SUBSURFACE AND MEAN VELOCITIES PAST A VERTICAL.

TABLE XXVIII.

Soláni Embankment Main Site—Non-Central Vertical

[*Instruments—1¾' Double-Floats, and 1" tin Tube-Rods*].

Serial No.	1	2				3				4				5	6				7		9		
	Date, 1877.	Depth. Above Datum.	Depth. Actual.	Depth. Variation.	Length of Rod.	Fall of Water-Surface. Upper 4 miles.	Fall. 1 mile below Site	Fall. Lower 4 miles.	Local Slope.	Wind. From. Direction.	Wind. From. Velocity.	Wind. To. Direction.	Wind. To. Velocity.	Timekeeper's Initial.	Subsurface Velocities past the vertical of Experiment [Each Velocity is the mean of three observations]. Nominal Depths (z) 0	1	2	Bed velocity.	Discharge past the vertical	…city …tical …ions	Rod Velocity Mean of 8 trials.	Differences.	
		h	H		l	P_1	P_2	P_3	S									v_B	D		u	$(v_M - U)$	$(u - U)$
Series 41.	10-4-'77	8 84	2·64	+ 01	2½	4 60	1·23	4 88	Not observed.	W	5	SW	1	P	2 52	2 75	2 26	1 96	6	[illegible]	2 43	+ ·08	− 08
	„ „	·83	·63	+ 02	2½	4 58	„	4 89		SW	1	N	9	W	2 63	2 56	2 44	2 36	6	[illegible]	2 59	+ 01	+ 08
	„ „	·83	·63	− 01	2½	„	1·22	4 90		N	9	N	8	P	2 68	2 54	2 31	2 16	6	[illegible]	2 50	00	+ 04
	„ „	·83	·65	+ 01	2½	„	„	„		N	8	W	4	W	2 73	2 61	2 27	2 05	6	[illegible]	2 22	+ 03	− 25
	20-4- „	·73	·55	·00	2½	4·58	1 10	4 83		SW	5	SW	9	P	2 38	2 33	2 34	2 30	5	[illegible]	2 41	− 01	+ 08
	„ „	·76	·56	+ 01	2½	4 57	„	4 84		SW	9	SW	6	W	2 40	2 34	2 24	2 18	5	[illegible]	2 39	·00	+ 08
	„ „	·76	·56	− 01	2½	„	„	„		SW	5	SW	9	P	2 61	2 56	2 22	2 03	6	[illegible]	2 22	+ 03	− 21
	„ „	·78	·53	+ 01	2½	4 58	„	4 83		SW	9	SW	7	W	2 46	2 44	2 22	2 10	6	3	2 21	+ 03	− ·14
	„ „	·75	·53	− 01	2½	„	„	„		SW	7	SW	7	P	2 63	2 21	2·05	1·96	6	7	2 24	− 03	+ 04
	„ „	·75	·55	·00	2½	„	„	„		SW	7	SW	7	W	2 34	2 50	2 22	2 07	6	[illegible]	2 22	+ 06	− 14
	21-4- „	·73	·55	·00	2½	4 58	1 20	4 82		WSW	11	W	7	P	2 46	2 50	2 21	2 0[illegible]	6	[illegible]	2 21	+ 04	− 17
	„ „	·73	·55	·00	2½	„	„	„		W	7	W	8	W	2 61	2 40	2 40	2 40	6	[illegible]	2 38	− 03	− 05
	„ „	·75	·55	·00	2½	„	„	„		W	8	W	6	P	2 63	2 38	2 34	2 32	6	7	2 26	− 03	− ·14
	„ „	·75	·53	− 01	2½	„	„	„		W	6	WSW	13	W	2 48	2 57	2 27	2 13	6	5	2 30	+ 04	− ·11
	„ „	·75	·55	+ ·01	2½	„	„	„		WSW	13	W	7	P	2·70	2 50	2 25	2 1[illegible]	6	3	2 27	+ 01	− 15
	„ „	·74	·54	− 02	2½	4 59	„	4 81		W	7	SW	4	W	2 34	2 44	2 55	2 61	6	7	2 24	00	− 23
δ	Range,	·11	·11	..	0	·02	04	·09	..	..	..	..	..	..	·39	·54	·50	·63	1	2	·35	11	·33
v	Means of 16,	8·78	2·58	..	2 50	4 58	1 20	4 84	..	W 6 S 5				..	2 54	2 47	2 29	2 17	6	2	2 32	+ 02	− 08
v′		Parabolic, (v′)		..	..	..	..	..	..	..	..	..	..	..	2 54	2 47	2 20	2 14	6	3	..	+ 03	..
Δ		Discrepancies, (v − v′)					..	..	..	—	..	..	..	..	00	00	00	+ 03		1	..	− 01	..

Centre of 9th step, Left Bank,
„ 79 1/10 Left of Centre

TABLES XXIX.—XXXIII.

VELOCITIES PAST A TRANSVERSAL.

SURFACE VELOCITIES.

Soláni Left Aqueduct Site, ...	Series 51, 52,	Tables XXIX.
Solaní Right Aqueduct Site, ...	Series 53 to 59,	„ XXX, XXXI.
Soláni Embankment Minor Sites,	Series 60,	„ XXXIII

MID-DEPTH VELOCITIES

Soláni Right Aqueduct Site,	Series 61, 62,	Table XXXII.

BED-VELOCITIES.

Soláni Right Aqueduct Site,	Series 65, 66,	Table XXXII.

In these Tables each line shows a SET of various data collected *nearly at one time.* Such SETS of similar work as were done at nearly the same water level and do not differ greatly in the velocities are grouped together into one SERIES.

In any one SERIES, the SETS done in one day follow *usually in the order of execution*, the work of different days is arranged generally by order of depth of water

The SERIES are numbered from 51 to 66 those done upon the same transversal at the same Site following each other (by number) by order of depth of water

The last two lines (marked δ, v, of each Series contain the following quantities for each Column, viz —

δ, "Range" of (i e., difference between the greatest and least of) the quantities in the column.
v, Mean of the quantities in the column.

Explanation of the Columns

Col.	Symbol	Detail.
	b l	Surface-Breadth Length of Connector of Double Floats (In Series 51, 68, 65, 66)
3	F_1 F_2 S	Fall of water-surface in upper part of the Reach. Fall of water surface in lower part of the Reach. Local Surface-Slope, (3 decimals, i e., 000 to be prefixed by reader).
4		Direction (referred to the current axis as N S. line), and Velocity (in feet per second) of the Wind, at beginning and end of each SET.
5		Initials of the Timekeeper
6	v_y	Velocities at surface mid depth or bed, past the verticals whose distances (y) from mid channel are specified at the head of each sub-column, each entry being the mean of 3 observations
7	D	Discharge past the transversal (in sq ft. per sec), computed from the velocity-data of Col 6.
8	U	Mean velocity past the transversal computed as the quotient Discharge — Breadth.

SURFACE VELOCITIES

Solání Left

[*Instrument*—3″

Serial No.	1	2					3			4				5			Sur	
	Date, 1875	Depth			Surface-Breadth.	Length of Connector	Fall of Water-Surface.			Wind				Timekeeper's Initial			past	
										From		To			[Each Velocity			
		Central	Variation.	Hyd Mean			Upper 5 miles.	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity		Left of			
		H		R	b	l	F_1	F_2	S						12½	·0½	37½	38
Series 51.	21-1 '75	9 0	00	7 47	83 5	..	5 75	5·00	Not observed	SW	0	SSW		W	Assumed zero in computing Discharge.	Not observed.	3 30	3 53
	,, ,,	03	·00	47	5	..	,,	,,		SSW	0	SW		R			3 30	3 57
	,, ,,	03	00	47	·5	..	,,			SW	0	SW		W			3 13	3 33
	22 1· ,,	·00	00	44	6	..	5 75	5 00		..	0	..		W			3 33	3 75
	,, ,,	·00	00	44	6	..	,,	,,		..	0	..		R			3 19	3 49
	,, ,,	00	00	44	6	..	,,	,,		..	0	..	0	R			3 49	3 75
	,, ,,	00	00	·44	6	..	,,	,,		.	0	SW		W			2 94	3 26
	23 1· ,,	8 9	00	·41	7	..	5·75	4 85		S	7	S		R		2 78	3 13	3 57
	,, ,,	·93	00	41	·7	..	,,	,,		S	7	SW		R		2 78	3 19	3 41
	,, ,,	93	00	41	·7	..	,,	,,		SW	7	SW		W		2 83	3 13	3 41
	,, ,,	93	00	41	7	..	,,	,,		SW	7	W		W		2 83	3 33	3 57
	23·1· ,,	90	00	38	·7	..	5 80	4 90		..	0	..	0	W		Not observed.	3 26	3·66
	,, ,,	90	00	38	·7	..	,,	,,		..	0	..	0	W			3 33	3 57
	,, ,,	90	00	·38	7	..	,,	,,		S	11	..		R			3 06	3 66
	,, ,,	90	00	38	·7	..	,,	,,		S	11	SSW	11	R			2 94	3 66
δ Range,		15	..	09	·2	..	05	15	..	..	..	..	..	..	?	? 05	·55	49
v Means of 15		8 97	..	7 42	83 7	..	5 76	4 93	..	SSW 3				..	?	?2 81	3 20	3 33
Series 52.	5-2-'75	8 90	00	7·38	83 7	..	5 70	4 95	Not observed.	W	7	S		R	Assumed zero in computing Discharge.	2 78	3 19	3 57
	,, ,,	90	·00	·38	7	..	,,	,,		S	8	S		W		2 94	3 26	3 33
	,, ,,	90	00	·38	7	..	,,	,,		S	15	SW		R		2 88	3 06	3 49
	,, ,,	90	00	·38	·7	..	,,	,,		SW	10	SW		W		2 83	3 26	3 49
	1 2· ,,	·80	00	·31	·9	..	5 75	4 75		..	0	..		W		3 06	3 19	3 40
	,, ,,	80	00	31	9	.	,,	,,		.	0	SW	1	W		3 00	3 33	3 57
	,, ,,	80	00	·31	9	..	,,	,,		SW	15	SW		R		2 88	3 19	3 33
	2·2· ,,	80	00	·31	9	..	5 70	4 80		..	0	..		R		2 83	3 19	3 66
	,, ,,	·80	00	31	9	..	5 75	,,		..	0	..		W		2 78	3 13	3 57
	,, ,,	80	00	·31	9	..	,,	,,		..	0	SE		R		2 88	3 33	3 33
	4·2· ,,	·80	00	·31	9	..	5 75	4 85		N	12	NE	10	W		2 78	3 33	3 40
	,, ,,	·80	00	·31	9	..	,,	,,		N	10	NE		R		2 94	3 19	3 40
	,, ,,	80	·00	·31	9	..	,,	,,		NE	9	SE		W		2 94	3·19	3 49
	6 2· ,,	·73	00	·25	9	..	5 75	4 80		..	0	SW		R		2 78	3 19	3 40
δ Range,		·15	..	·10	2	..	·05	·20	..	..	..	..	.	.	?	·28	·27	33
v Means of 14		8·83	..	7·33	83·8	..	5·73	4 88	..	SSW 3				..	?	2·88	3·22	3·40

AND DISCHARGES.

TABLE XXIX.

AQUEDUCT

Surface Floats]

6															7	8
FACE VELOCITIES each vertical. s the mean of three observations.															SURFACE DISCHARGE in sq feet per sec	MEAN SURFACE VELOCITY
centre.				Centre	Right of centre											
32½	30	20	10		10	20	30	32½	35	37½	40	41½	41⅞	42½	D	U₀
Not observed	3·80	4·29	4·17	4·35	4·22	4·29	3·95	Not observed.	3·75	3·26	2·97	Not observed	Not observed	Assumed zero in computing Discharge	334·0	3·93
	3·90	4·17	4·55	4·35	4·35	3·90	3·85		3·66	3·26	2·86				328·1	3·86
	3·85	4·11	[illegible]	4·30	4·11	4·20	4·00		3·61	3·45	2·80				324·0	3·82
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·85	3·57	3·00				340·0	4·00
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·66	3·33	2·94				330·[illegible]	3·89
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·85	3·41	2·73				332·0	3·91
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·66	3·49	2·88				334·1	3·93
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·33	3·06	3·06	2·34			322·[illegible]	3·80
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·33	3·41	2·78	2·28			327·0	3·85
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·49	3·19	2·94	2·38			327·1	3·85
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		3·41	3·19	3·00	2·68			323·9	3·81
	4·00	4·17	4·48	4·29	4·29	4·17	4·11		3·75	3·41	3·06	Not observed			333·5	3·92
	3·95	4·22	4·41	4·17	4·29	4·11	4·11		3·75	3·41	3·00				330·5	3·89
	3·95	4·11	4·11	4·35	4·29	4·22	3·80		3·75	3·41	2·83				317·6	3·74
	3·70	3·85	4·11	4·17	4·05	4·05	3·80		3·66	3·41	3·00				329·9	3·88
..	52	50	44	24	50	45	49	..	52	51	33	? 40	.	?	22·2	26
..	3·91	4·15	4·31	4·24	4·24	4·14	3·99	..	3·6[illegible]	3·35	2·92	?2·42	..	?	329·1	3·87
3·66	3·90	4·05	4·17	4·05	4·17	4·22	3·95	3·90	3·66	3·33	3·06	2·72	2·20	Assumed zero in computing Discharge	323·0	3·81
3·61	3·66	4·11	4·11	4·05	3·95	3·95	3·95	3·85	3·66	3·26	2·94	2·78	2·27		318·1	3·74
3·66	3·70	4·00	4·17	4·17	4·22	3·85	3·80	3·70	3·33	3·13	2·88	2·50	2·14		315·4	3·71
3·49	3·75	4·11	4·35	4·17	4·05	3·95	3·85	3·90	3·49	3·33	2·83	2·68	2·27		320·8	3·77
3·75	3·90	4·17	4·29	4·11	4·35	4·11	4·00	3·85	3·75	3·40	3·13	2·78	2·50		326·7	3·84
3·90	4·00	4·05	4·29	4·35	4·22	4·05	4·00	3·90	3·66	3·33	2·94	2·78	2·34		323·1	3·87
3·61	3·70	4·05	3·90	4·11	4·05	4·05	3·85	3·95	3·33	3·19	2·83	2·94	1·88		319·3	3·76
4·05	4·05	4·11	4·17	4·41	4·29	4·22	4·11	4·00	4·17	3·57	3·33	2·94	2·08		336·7	3·96
3·70	3·85	4·22	4·29	4·41	4·35	4·17	4·11	4·00	3·85	3·40	3·13	2·88	2·14		334·3	3·93
3·61	3·80	4·22	4·29	4·29	4·11	4·11	4·05	4·05	3·66	3·49	3·26	2·94	2·21		330·7	3·89
3·75	3·90	4·29	4·41	4·48	4·22	4·17	4·11	4·00	3·85	3·57	3·13	2·68	2·34		338·0	3·98
3·61	4·11	4·22	4·11	4·17	4·48	4·22	4·05	3·70	3·75	3·49	3·40	3·06	2·34		331·0	3·89
3·80	3·95	4·22	4·55	4·41	4·29	4·11	3·95	3·85	3·57	3·40	3·00	2·75	2·21		333·1	3·92
3·75	3·85	4·05	4·11	4·00	4·17	4·00	3·85	3·80	3·40	3·00	3·13	2·50	2·14		316·5	3·72
56	45	29	65	48	53	37	31	35	84	57	57	56	62	?	22·0	27
3·71	3·87	4·13	4·23	4·23	4·21	4·08	3·97	3·89	3·6[illegible]	3·3[illegible]	3·07	2·78	2·2[illegible]	?	327·7	3·84

SURFACE VELOCITIES

Soláni Right

[*Instrument*—3″

Serial No	1	2					3			4				5				
		Depth					Fall of Water-Surface.			Wind					SUR past [Each Velocity Left of			
										From		To						
	Date 18 5 76 "8	Central	Variation	Hyd. Mean	Surface-Breadth	Length of Connector	Upper 5 miles	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity	Timekeeper's Initial				
		H		R	b	l	F_1	F_2	S						42½	41⅞	41½	40
Series 53.	2 8 '78	9 95	00	7 95	82 0	..	6 07	5 40	Not observed	V	4	S	12	P	Assumed zero in computing Discharge	3 00	3 53	3 92
	3 8 ,,	95	00	95	0		6 05	5 35		NNE	8	N	5	R		3 13	3 33	4 17
	,, ,,	95	00	95	·0		,,	,,		N	5	N	8	P		3 53	3 37	3·92
	1-8· ,,	91	+ 01	93	0		6 06	5 41		SSE	3	V	6	P		3 19	3 49	3 90
	,, ,,	93	+ 04	94	0		6 04	5 43		V	6	V	5	R		3 19	3 41	4 11
	28 11 ,,	89	+ 03	91	0	·	6 01	5 49		..	0	V	4	P		3 33	3 53	3 70
	,, ,,	81	− 02	91	0	·				V	4	..	0	R		3 68	3 03	3 39
	29 11· ,,	89	− 03	91	·0	..	6 01	5 49		E	7	E	6	P		3 19	3 33	3 61
	,, ,,	89	+ 03	91	0	..	,,			E	8	·	0	R		3 13	3 30	3 49
	27 11 ,,	90	00	92	·0	·	6 00	5 50		·	0	·	0	R		2 68	3 09	3 80
	,, ,,	89	− 03	91	0	·	6·01	5 19		..	0	..	0	P		2 68	3 33	3 82
	,, ,,	86	− 03	90	0	·	6 04	5 46		..	0	..	0	R		2 78	3 23	3 64
	26 11 ,,	87	00	90	0		6·03	5 47		..	0	V	4	P		2 68	3 49	3 92
	,, ,,	87	00	90	0		,,			V	9	E	7	R		2 68	3 26	3 41
	,, ,,	87	00	90	0					E	7	V	11	P		2 78	3 33	3 82
	5 8· ,,	82	+ 01	91	~		6 16	5 27		NW	7	NW	10	R		3 19	3 80	3·90
δ	Range,	·13	..	05	5	..	18	23	..	..	..	..	·		?	85	77	76
v	Means of 14	9 90	·	7 92	82 0	..	6 01	5 41	·	NE 2				·	?	2 99	3 37	3 78
54.	10-2 '73	9 15	00	7 53	83 4	..	5 65	5 10	Not observed	N	14	..	0	R	?0	2 20	2 72	3 13
	,, ,,	15	00	53	·4	..	,,	,,		,,	0	..	0	W	?0	1 9·	2 63	2 88
	,,	15	00	53	4	·	,,	,,		W	10	·	0	R	?0	2 14	2 63	3·00
	19 2 76	8 55	+ 05	41	7		5 75	5·00		SW	4	NW	15	H	?0	?	?	3 03
δ	Range	20	..	12	3		10	10	..	..	·	..	·	..	?	? 28	09	25
v	Means of 4,	9·10		7 50	83 4		5 68	5 08	..	NW 6 W 5				..	?	?2·09	?2 60	3·01
55	18-2 76	8 75	+ 05	7 30	83	·	5 92	4 85	?	·	0	SSW	23	W	?0	?	?	3 09
Series 56.	11 2 73	8 80	00	7 31	83 9	..	5 80	4 80	Not observed	..	0	..	0	W	Assumed zero in computing Discharge	2 08	2 46	2·94
	,, ,,	80	00	31	9	..		·		S	10	..	0	R		2 14	2 46	2 88
	8 2· ,,	75	00	28	9	·	5 75	4 75		..	0	..	0	W		2 2·	2 78	2 83
	,, ,,	·75	00	·28	9	..	,,	,,		..	0	..	0	R		1 78	2 50	2 78
	,, ,,	75	00	28	9	..	·	,,		..	0	..	0	W		2 34	2 46	2·83
	9-2· ,,	·75	00	28	9	..	5 75	4 75		·	0	..	0	R		1 97	2 72	3 1
	,, ,,	75	00	28	9	..	,,	,,		..	0	..	0	W		1 92	2 59	2 94
	,, ,,	75	00	28	9	..	·	,,		..	0	..	0	R		1 92	2 88	3·00
	,, ,,	75	00	23	9	..	·	,,		..	0	SW	4	W		2·03	2 54	2·94
	12 2 ,,	65	00	21	84·0	..	5 75	4 65		..	0	·	0	W		2 08	2 54	2 88
	,, ,,	65	00	21	·0	..	,,	,,		SW	8	..	0	R		2·03	2 59	3 19
	,, ,,	65	?	21	0	..	,,	,,		S	23	SW	5	W		2 34	2 54	2 94
	13-2· ,,	·65	00	21	·0	..	5·65	4·65		..	0	..	0	R		1 9·	2 67	2 83
	,, ,,	65	00	21	0	·	,,	,,		..	0	..	0	W		2·03	2 50	2·94
	,, ,,	65	00	21	·0	..	,,	,,		..	0	..	0	R		2·03	2 35	2·94
	,, ,,	·65	00	21	·0	..	,,	,,		..	0	..	0	W		2·03	2 73	2·85
δ	Range,	15	..	10	·1	..	15	15	..	..	..	..	·	..	?	56	50	41
v	Means of 14	8·71	..	7 25	83·9	·	5·73	4 71	..	SSW 2				..	?	2·06	2·58	2 93

AQUEDUCT

Surface-Floats]

6															7	8
FACE VELOCITIES each vert cal is the mean of three observations)															SURFACE DISCHARGE in sq feet per sec.	MEAN SURFACE VELOCITY
centre.						Centre	Right of centre									
37½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	42½	D	U₀
3·95	4·38	4·55	4·69	4·69	4·61	4·84	4·44	4·41	4·08	3·87	3·75	3·51	Not observed	Assumed zero in computing Discharge	367·7	4·33
4·35	4·55	4·69	5·00	5·00	5·13	5·05	4·84	4·88	4·05	4·00	3·61	3·57			390·2	4·59
4·32	4·33	4·84	4·88	5·00	5·00	5·12	4·84	4·83	4·32	4·05	3·83	3·41			391·0	4·61
4·22	4·48	4·41	4·92	4·69	5·17	5·00	4·76	4·44	4·41	4·05	3·90	3·57			377·7	4·44
4·29	4·61	4·76	4·65	5·17	4·92	5·00	4·92	4·84	4·48	4·11	3·85	3·41			391·1	4·60
4·08	4·17	4·08	4·58	4·84	4·61	4·61	4·44	4·12	3·87	3·77	3·61	3·53			360·6	4·24
3·80	4·48	4·41	4·12	4·55	4·65	4·51	4·35	4·22	3·77	3·66	3·66	3·41			353·1	4·14
4·08	4·44	4·22	4·32	4·48	4·55	4·39	4·26	4·08	3·90	3·75	3·68	3·30			346·0	4·07
3·91	4·05	4·41	4·35	4·51	4·55	4·41	4·32	4·22	4·00	3·64	3·43	3·33			483·[illegible]	4·10
4·11	4·17	4·38	4·6[illegible]	5·00	4·72	4·76	4·58	4·26	4·11	3·75	3·61	3·33			366·7	4·31
4·41	4·48	4·16	4·58	4·80	5·00	4·75	4·48	4·22	3·97	3·97	3·51	3·45			366·0	4·31
4·29	4·61	4·55	4·48	4·76	4·72	4·35	4·44	4·17	3·95	3·95	3·66	3·26			354·8	4·17
3·77	4·4	4·44	4·69	4·61	4·41	4·80	4·51	4·37	4·03	4·00	3·[illegible]	3·61			363·0	4·27
4·29	4·29	4·44	4·61	4·76	5·00	4·80	4·48	4·26	4·00	3·66	3·53	3·26			363·6	4·23
4·08	4·26	4·33	4·69	4·44	4·26	4·76	4·51	4·22	3·8[illegible]	3·73	3·64	3·37			355·1	4·19
4·35	4·55	4·84	4·92	5·26	5·36	5·00	4·69	4·55	4·32	3·90	3·70	3·61			380·6	4·58
64	56	62	·68	82	1 10	78	66	80	71	47	47	35	..	?	45 5	54
4·15	4·39	4·53	4·67	4·79	4·79	4·76	4·50	4·39	4·08	3·86	3·60	3·48	..	?	367·6	4·33
										3·61	3·40	3·40	2·42	70	330·1	3·88
										3·72	3·49	3·26	2·63	70	330·4	3·89
										3·66	3·41	3·26	2·63	70	329·1	3·87
										3·49	3·24	3·15	2·65	70	325·9	3·83
30	44	·15	24	15	29	38	31	24	39	26	25	27	23	?	5 0	06
3·35	3·63	3·94	4·14	4·22	4·16	4·19	4·29	4·17	3·84	3·63	3·39	3·26	2·58	?	328·7	3·87
3·82	3·64	3·97	4·05	4·05	4·11	4·05	4·17	4·05	3·59	3·26	3·16	3·01	2·59	70	320·9	3·78
										3·70	3·49	3·06	2·88	Assumed zero in computing Discharge	326·1	3·84
										3·40	3·49	3·13	2·42		317·5	3·74
										3·57	3·13	3·06	2·78		329·6	3·88
										3·80	3·19	3·19	2·78		339·7	4·00
										3·61	3·40	3·19	2·78		328·2	3·86
										3·80	3·33	3·26	2·63		328·4	3·86
										3·80	3·66	3·19	2·63		332·4	3·91
										3·70	3·49	3·06	2·83		327·2	3·85
										3·66	3·49	3·33	2·59		327·8	3·86
										3·57	3·49	3·33	2·88		313·1	3·68
										3·45	3·49	2·88	2·75		308·2	3·63
										3·37	3·13	2·88	2·59		306·3	3·60
3·13	3·49	4·05	4·05	4·22	4·17	4·00	4·05	4·00	3·61	3·57	3·33	3·13	2·68		319·3	3·76
3·40	3·49	3·61	4·05	3·50	3·90	3·95	4·05	4·11	3·66	3·61	3·57	3·26	2·88		309·9	3·65
3·26	3·57	3·95	3·95	3·90	4·14	4·29	4·22	4·22	3·64	3·53	3·49	3·26	2·94		321·6	3·79
3·40	3·49	3·85	3·95	3·80	3·95	3·95	4·05	3·95	3·85	3·70	3·49	3·06	2·88		312·1	3·67
27	35	54	47	59	75	79	41	55	48	43	53	45	52			40
3·29	3·59	3·80	3·99	4·04	4·03	4·19	4·17	4·09	3·79	3·62	3·42	3·14	2·7[illegible]			3·70

SURFACE VELOCITIES

SOLANI RIGHT

[*Instrument—3"*

	1	2					3			4				5				
		DEPTH.					FALL of Water Surface.			WIND					SUR past [Each Velocity Left of			
										From		To						
Serial No	Date, 1875-78 79	Central	Variation	Hyd Mean	Surface Breadth	Length of Connector	Upper 5 miles	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity	Timekeeper's Initial				
		H		R	b	l	F_1	F_2	S						42½	41¾	41½	40
Series 57.	8 11-'78	8 62	00	7 19	84 0		6 13	4 60	230	..	0	V	9	R	Assumed zero in computing Discharge.	2 42	3 13	3 23
	,, ,,	62	00	19	0				233	V	9	NW	10	P		2 50	3·00	3 24
	4-11- ,,	60	00	18	0	..	6 15	4 55	213	..	0	S	7	P		3 13	3 33	3 51
	,, ,,	60	00	18	0	..	,,	,,	223	S	7	..	0	R		2 94	2 68	3 57
	,, ,,	60	00	18	0	..			233	.	0	..	0	P		3 33	2 83	3 41
	5 11- ,,	60	00	18	0	.	6 15	4 60	223	.	0	..	0	R		2 88	3 00	3 49
	,, ,,	60	00	18	0		,,	,,	225	W	8	..	0	P		2 50	3 03	3 35
	14-12 '75	55	+ 10	15	1	.	6 15	4 75	Not observed	..	0	S	6	W		2 78	3 06	3 26
	13 12 ,,	55	00	15	1	.	5 95	4 85		.	0	V	7	H		2 88	3 13	3 19
	,, ,,	53	- 05	13	1	..	5 97	4 83		V	1	V	7	W		3 50	3 0	3 41
	,, ,,	50	00	11	·1		6·00	4 80		V	7	.	0	H		2 27	3 00	3 57
	,, ,,	·50	00	11	1		,,			..	0	..	0	W		3 00	3·06	3 37
	14 12· ,,	50	00	11	1		5 95	4 70		..	0	..	0	H		2 42	3·00	3 49
	,, ,,	50	00	11	1	.	6 20	,,		..	0	..	0	W		2 42	3 00	3 26
	,, ,,	50	00	11	·1	.	,,	,,		..	0	.	0	H		2 59	3 19	3 37
	24 10 '78	50	00	11	1	.	6·50	4 30	178	..	0	.	0	R		3 80	3 49	4 17
	δ Range,	12	..	08	1	.	55	55	?055	..	..	..	.	.	?	1 53	81	98
	v Means of 14,	8·55	..	7 15	84 1	..	6 12	4 06	?220	W b N 1				..	?	2 77	3·06	3 43
Series 58.	2 4-'79	8·19	00	6 91	84 3	..	5 81	4 49	195	..	0	..	0	Cl	Assumed zero in computing Discharge.	2 69	3·09	3 57
	,, ,,	·19	00	91	3	.	,,	.	203	..	0	..	0	C		2 54	2 73	3 26
	3 4· ,,	15	00	87	3	..	5 85	4 40	196	SW	6	V	7	Cl		2 69	2 88	3 30
	,, ,,	16	+ 01	87	3	..	5 84	4 41	198	V	1	V	7	C		2 38	2 78	3 23
	11-12 '75	15	00	87	3	..	6·05	4 55	?	..	0	..	0	H		2 50	2 94	3 19
	,, ,,	15	00	87	3	..	.	,,	?	..	0	S	6	W		2 68	3 19	3 49
	,, ,,	·13	+ 05	86	3	..	6 07	4 53	?	..	0	..	1	W		2 88	2 77	3 16
	,, ,,	10	00	84	3	.	6 00	4 50	?	..	0	.	0	H		2 27	3 13	3 33
	5 12 78	00	+ 01	77	4	..	6·00	4·30	195	SW b S	3	WSW	6	A		2 54	2 97	3 19
	15 8 ,,	7 96	- 06	74	4	.	7 24	3 96	190	..	0	SSE	5	P		3 37	3 53	3 77
	16-8 ,,	95	·00	73	·4	..	6 30	4 05	188	..	0	..	0	R		3 19	3 06	3 80
	,, ,,	95	·00	73	·4	..	.	,,	,,	..	0	..	0	P		3 23	3 33	3 64
	21 10 ,,	93	00	72	4	..	6 52	3 78	200	..	0	S	5	R		3 41	4 05	3 75
	,, ,,	92	- 03	71	4	..	6·53	3 77	190	S	5	.	0	P		3 26	3 41	3 87
	δ Range,	27	..	20	·1	..	1 43	78	?115	..	..	..	.	..	?	1 10	1 32	71
	v Means of 14	8·07	..	6·81	84 4		6 17	4 27	?195	S b W 1				..	?	2 83	3 13	3 47
59.	9 12 '75	7 70	?	6 56	84 5	..	75 90	4 20	Not observed	V	5	SE b E	11	H	?0	Not observed	3 00	3 16
	10-12- ,,	50	00	41	5	.	6 10	4 00		V	6	SW	10	H	?0		3 41	3 41
	,, ,,	·50	00	41	5	..	,,	,,		SW	10	V	5	W	?0		3 06	3 23
	δ Range,	20	..	·15	0	..	7 20	20	.	..	..	..	..	..	?	..	41	25
	v Means of 3,	7 57	..	6 46	84 5	..	?6·03	4 07	..	S b W 7				.	?	..	3·10	3 27

FOR SERIES 60, (AT SOLANI EMBANKMENT

AND DISCHARGES

TABLE XXXI

AQUEDUCT

Surface-Floats]

6															7	8
FACE VELOCITIES each vertical is the mean of three observations]															SURFACE DISCHARGE in sq feet per sec	MEAN SURFACE VELOCITY
centre						Centre	Right of centre									
37½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	42½	D	U₀
3·70	3·92	4·03	4·11	4·35	4·80	4·61	4·80	4·32	4·22	4·05	3·66	3·45	3·33		354·6	4·17
3·61	4·03	4·11	4·22	4·38	4·26	4·26	4·22	4·14	4·05	3·87	3·51	3·59	3·26		342·0	4·02
4·05	4·22	4·44	4·80	4·58	4·58	4·55	4·55	4·89	4·41	4·44	4·20	3·87	3·61	Discharge	375·8	4·42
3·92	4·00	4·20	4·48	4·44	4·16	4·58	4·41	4·51	4·26	4·20	4·11	4·00	3·57		364·[illegible]	4·28
3·82	4·00	4·41	4·22	4·72	4·55	4·61	4·48	4·51	4·32	4·05	3·87	3·82	3·80		367·4	4·32
3·80	4·17	4·32	4·29	4·61	4·41	4·11	4·6[illegible]	4·18	4·20	4·05	3·[illegible]	3·[illegible]5	3·80		363·0	4·28
3·75	4·32	4·14	4·14	4·29												4·21
3·70	3·85	4·00	4·41	4·29												4·06
3·90	3·75	4·00	4·11	4·11												4·00
3·[illegible]7	3·85	4·00	4·35	4·39												4·05
3·80	3·[illegible]0	4·05	4·22	4·22												4·00
4·11	3·80	4·11	4·35	4·41												3·98
3·90	3·53	4·11	4·45	4·37												4·00
3·49	3·80	4·00	4·29	4·35	4·35	4·69	4·22	4·17	3·80	3·95	3·75	3·49	3·33	Assu	347·0	4·09
3·93	3·85	4·11	4·22	4·48	4·35	4·41	4·29	4·22	3·95	3·70	3·66	3·45	3·13		347·2	4·08
4·55	4·96	5·00	5·04	5·08	5·04	5·00	4·61	4·03	3·85	3·64	3·61	3·51	3·30		379·7	4·47
1·06	1·43	1·00	·93	·97	·89	·89	·69	·89	·61	·83	·71	·63	·77	?	41·5	·49
3·8[illegible]	3·98	4·19	4·30	4·42	4·51	4·40	4·38	4·31	4·06	3·95	3·77	3·58	3·37	?	362·[illegible]	4·15
3·80	4·00															3·86
3·45	3·70															3·74
3·53	3·[illegible]0															3·74
3·45	3·80															3·71
3·61	3·80															4·08
3·85	4·17															3·99
3·61	3·85															4·01
3·75	4·22															4·10
3·87	4·14															4·01
4·00	4·32															4·31
4·20	4·35															4·30
4·26	4·41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	4·29
4·22	4·69	4·72	4·88	4·55	4·72	4·72	4·61	4·08	3·80	3·80	3·68	3·64	3·49	Assu	364·[illegible]	4·29
4·41	4·69	4·88	4·[illegible]6	4·92	4·69	4·72	4·35	4·11	3·95	3·75	3·61	3·43	3·33		368·[illegible]	4·34
·96	·99	1·27	1·18	1·02	·81	·98	·91	·66	·56	·54	·40	·46	·43	?	53·[illegible]	·63
3·86	4·13	4·18	4·33	4·39	4·36	4·38	4·25	4·09	3·88	3·79	3·62	3·47	3·32	?	345·[illegible]	4·06
3·61	4·00	3·95	4·29	3·66	3·75	3·85	4·29	4·46	4·17	3·90	3·70	3·33	3·33	?0	326·3	3·84
3·61	4·05	4·05	4·17	4·22	4·22	4·48	4·17	4·22	4·00	3·85	3·85	3·53	3·41	?0	344·4	4·05
3·70	3·85	4·22	4·29	4·00	4·05	4·17	4·11	4·05	3·90	3·85	3·57	3·41	3·19	?0	330·7	3·89
·09	·20	·27	·12	·56	·47	·63	·18	·43	·27	·05	·28	·20	·22	?	18·1	·21
3·64	3·97	4·07	4·25	3·96	4·01	4·17	4·19	4·25	4·02	3·87	3·71	3·49	3·31	?	333·8	3·93

MINOR SITES,) SEE TABLE XXXIII

MID-DEPTH AND BED VELO-

SOLANI RIGHT

[*Instrument*—1⅝″

N B.—These are velocities past a transversal a little

	1	2					3			4				5				
		Depth					Fall of Water-Surface.			Wind					Mid-Bed past (Each Velocity			
										From		To			Left of			
Serial No	Date 1875 77	Central H	Variation	Hyd Mean R	Surface Breadth b	Length of Connector l	Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	42½	41¾	41¼	40
Series 61.	16 6 '77	10 10	00	8 05	82 0	5	5 90	5 70	Not observed.	E	4	E	4	W	Assumed zero in computing Discharge	Not observed	3 35	3 70
	25 9 ,,	02	09	00	0	5	6 06	5 57		..	0	V	5	G			3 49	4 11
	26 9 ,,	02	+ 04	·00	0	5	6 06	5 52		NNE	4	NNE	9	P			3 64	3 68
	27 9 ,,	02	+ 04	00	0	5	6·06	5 52		..	0	NNE	12	G			3 85	4 17
	28-9 ,	02	+ 02	00	0	5	6 06	5 52		NW	4	NNE	12	P			3 73	5 97
	29 9- ,	01	− 02	00	0	5	6 07	5 51		NW	3	.	0	G			3 57	4 05
	2 10 ,,	02	·00	00	0	5	6 06	5 52		ENE	4	ENE	7	P			3 85	4 11
	3 10- ,,	02	00	00	·0	5	6 06	5 52		E	4	E b N	0	G			3 49	4 11
	4 10- ,,	02	00	00	0	5	6 06	5 52		E	4	V	4	P			3 37	3 82
	20-6 ,,	00	+ 02	7 99	0	5	5 70	5 60	210	W	7	SE	11	P			3 41	3 61
	14 6 ,, 15 6 ,	9 99	+ 10	98	0	5	5 76	5 67	Not observed.	NNE	7	NE	19	P			3 45	3 53 ..
	12 6· ,,	95	+ 04	97	0	5	5 72	5 63		N	5	NE	9	P			3 26	3 75
	13-8- ,,	98	+ 03	97	0	5	5 97	5 53		E	5	SW	17	W			3 53	3 68
	13 6 ,	96	+ 02	96	0	5	5 74	5 66		NW	7	N	0	W			3 35	3 75
	18 6 ,,	90	00	92	0	5	5 77	5 55		NW	7	NW	4	P			3 49	3 49
	19 6- ,,	·86	+ 02	90	·0	5	5 84	5 51		S	9	S	12	W			3 35	3 61
δ Range		24	..	15	0	0	37	10	?	..	..	..	.	..	?	..	59	68
v Means of 16		10 00	.	7 98	82 0	5	5 93	5 57	?	NE 2				..	?	..	8 54	3 82
62.	22 6 76	9 03	00	7 47	83 5	4½	5 80	4 70	?	S b W	9	SW	14	H	?0	?	3 30	3 70
65.	5-10 '77	10 00	00	7 99	82·0	10	6 08	5 50	Not observed.	E b N	6	V	8	G	?0	Not observed.	3 45	3 80
	6 10- ,,	00	00	99	0	10	6 08	5 50		V	4	V	7	P	?0		3 43	3 57
	8 10- ,,	00	00	99	0	10	6·08	5 55		E	4	N	6	G	?0		3 45	3 75
δ Range,		00	..	00	0	0	00	05	..	..	..	..	.	..	?	..	02	23
v Means of 3,		10 00	..	7 99	82 0	10	6 08	5 52	..	NE b E 4					?	.	3 44	3 71
Series 66	19-2 '76	8 95	+ 03	7 41	83 7	8	5 75	5 00	Not observed.	SW	4	NW	15	H	?0	Not observed.	Not observed.	2 97
	18 2- ,,	78	+ 05	30	9	8	5 92	4 88		..	0	SSW	2[illegible]	W	?0			3 14
	21 2 ,,	65	00	21	84 0	8	5 75	4 75		NE	8	V	6	W	?0			2 80
	,, ,,	68	+ 05	23	0	8	5 82	4 78		V	6	SW	20	H	?0			3 06
δ Range,		30	..	·20	3	0	·17	25	..	..	..	..	..	..	?	..	..	34
v Means of 4,		8·77	..	7 29	83 9	8	5·81	4 55	..	SW b W 5				.	?	..	.	2 99

CITIES AND DISCHARGES

TABLE XXXII

AQUEDUCT

Double Floats *in* *Series* 61—65 3' *Do ble Flo ts in Series* 66]

above he in d-depth or bed respect vely see see XX X

6															7	8
DEPTH VELOCITIES, SERIES 61 62. VE OCIT ES, SERIES 65, 66. each vertical is the mean of three observ tions															M D DEPTH OR BED DISCHARGE In sq. feet pe sec	MEAN MID DEPTH OR BED VELOCITY
centre						Cent e	Right of centre									
37½	35	32½	30	20	0		10	20	30	32½	35	3 ½	39½	41½	D	$U_{\frac{1}{2}H}$ or U_H
4·03	4 29	4 44	4 48	4 35	4 44	4 58	4 55	4 44	4 20	4 11	3 92	3·70	Not observed	Assumed zero in computing Discharge.	359·0	4 22
4 17	4 6	4 48	4 61	4 48	4 69	4 69	4 55	4 55	4 35	4 17	4 05	3 90			369 6	4 35
4 38	4 44	4·61	4 48	4 69	4 80	4 69	4·65	4 32	4·29	4 29	4 17	4 03			371 0	4 36
4·29	4 55	4 69	4 69	4 69	4 61	4 84	4 55	4 48	4 4	4 22	4 17	3·95			377 1	4 44
4·44	4 61	4 92	4 61	4 55	4 84	4 6	4 58	4 55	4 41	4 26	4 26	4 00			376 0	4 43
4 41	4 41	4 61	4 55	4 55	4 69	4 84	4 6	4 48	4 22	4 29	4 17	3 80			373 0	4 39
4 48	4 48	4 31	4 48	4 80	4 92	4 72	4 65	4 48	4 41	4 20	4 22	4 14			377 8	4 44
4 41	4 48	4 69	4 61	4 69	4 55	4 69	4 69	4 48	4 41	4 35	4 11	4·08			374 4	4·40
4·48	4 58	4 48	4·61	4·44	4 55	4 65	4 61	4 55	4 22	4·08	4 35	3 85			369 0	4 34
4 03	4 0	4 32	4 48	4 29	4 55	4 4	4 58	4 29	4 22	4 08	4 00	3 80			352 9	4 15
4 26	4 35	4 7	4 41	4 22	4 35	4 4	4 44	4 22	4·08	4 14	3 80	3 64			348 7	4 10
3 97	4·29	4 51	4 48	4 14	4 32	4 26	4 32	4 35	4 32	4 29	3 92	3 73			348 7	4 10
4 29	4 55	4 84	4 88	4 84	4 6	4·88	4 6	4 72	4 58	4 32	4 26	3 97			386 1	4 54
4·05	4 29	4 44	4 29	4 29	4 48	4 4	4 35	4 48	4 08	4 12	3·95	3 90			355 6	4 18
4 22	4 38	4 32	4 48	4 11	4 38	4 38	4 29	4·32	4·08	4 08	3 77	3 70			348·4	4 0
4 22	4 38	4 38	4 35	4 41	4 20	4 48	4 48	4 35	4 22	3·95	3 85	3 64			354·6	4 17
51	41	75	59	73	72	62	47	50	50	40	58	50		?	37 7	44
4·26	4 43	4 53	4 56	4 47	4 57	4 61	4·55	4 44	4 27	4 18	4 06	3·86		?	360 1	4 29
4 14	4 32	4 20	4 41	4 14	4 32	4 32	4 32	4 41	4·03	4 22	3 73	3 73	3 51	?0	350	4 13
4 11	4 17	4 29	4 55	4 48	4 48	4 48	4 41	4 48	4 29	4 32	3 90	3 85	Not observed.	?0	360 8	4 24
3·90	4 41	4 29	4 44	4 26	4 65	4 48	4 58	4 35	4 14	4 29	4 17	4 05		?0	356 6	4 20
4 11	4 29	4 22	4 48	4 41	4 48	4 55	4 4	4 22	4 17	4·00	3 90	3 80		?0	355·4	4 18
21	24	07	11	22	17	·07	17	26	15	29	27	23		?	5 4	06
4·04	4 29	4 27	4·43	4 38	4·54	4 50	4 47	4 35	4 20	4 17	3 99	3 89		?	357 6	4 21
3 49	3 37	3 59	3·66	3 70	3 64	3 70	3 75	3 75	3 64	3 33	3 22	3 16	2 50	?0	298·	3 51
3 31	3 43	3 68	3 51	3 73	3 85	3 57	3 85	3 70	3 55	3·24	3 35	2·83	2 78	?0	295 5	3 48
3 20	3 68	3 47	3 49	3·59	3 82	3 64	3 82	3 64	3 35	3 39	2 86	2 97	2 63	?0	291·0	3 42
3 21	3·30	3 51	3 68	3 70	3 51	3· 0	3 66	3 70	3 37	3 24	3 03	3·00	2 58	?0	294·0	3 46
29	38	21	12	14	34	13	19	11	29	15	49	33	28	?	7	09
3·30	3 40	3 56	3·59	3·68	3·71	3·65	3·7	3·70	3 48	3 30	3·09	2·9	2 60	?	294·	3·47

TABLE XXXIII.

SURFACE VELOCITIES AND DISCHARGES.

Solání Embankment Minor Sites

[Instrument—3" Surface Floats]

N B —This work at two Sites of very similar Cross-Section (see Plate XXVIII) combined into one series.

	1	2					3		4				5	6																			7	8	9
		Depth					Fall of Water-Surface		Wind					Surface Velocities past each vertical N B The Surface Discharge computed for 168' breadth throughout (Each Velocity is the mean of three observations)																			Surface Discharge in sq feet per sec	Mean Surface Velocity	Upper or Lower Site.
									From		To			Left of centre									Centre	Right of centre											
Serial No.	Date 18 5	Above Datum	Variation	Central	Solání Aqueduct Gauge	Surface-Breadth	Upper 5 miles	Lower 4½ miles	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	84	82	80	75	70	65	60	40	20		20	40	60	65	70	75	80	82	84			
		h		H		b	F_1	F_2																									D	U_s	
Series 60.	13 1	9 70	00	10 28	9 00	168 7	5 70	4 90	SW	12	SE	10	W	Assumed zero in computing D	2 22	3 19	3 45	3 75	4 05	4 35	4 55	4 35	4 35	4 41	4 17	4 05	3 90	3 61	3 33	3 06	2 34	Assumed zero in computing D	684 6	4 08	Upper.
	14 1	70	00	28	·00	7	5 70	4 95	SW	12	.	0	W		2 27	3 26	3 57	3 85	4 11	4 55	4 61	4 05	4 55	4 29	4 41	4 22	4 05	3 85	3 53	3 26	2 22		707 9	4 21	
	"	68	− 03	26	8 97	7	5 73	4 92	SW	12	W	27	R		2 50	3 53	3 90	3 90	4 41	4 35	4 17	4 29	4 22	4 11	4 22	4 17	4 00	3 80	3 53	2 88	2 27		678 3	4 04	
	15·1	55	00	13	85	167 5	5 75	4 85	NE	12	E b N	8	W		2 17	3 13	3 45	3 75	4 00	4 17	4 76	4 55	4 17	4 61	4 48	4 22	4 17	4 05	3 85	3 03	2 22		701 8	4 18	
	"	·55	·00	13	85	5	"	"	NE	12	S b E	4	R		1 89	2 78	3 23	3 70	3 80	3 90	4 55	4 29	3 90	4 17	4 17	4 29	4 00	3 70	3 53	2 91	2 16		661 4	3 94	
	7·1	54	·00	17	95	168 7	5 75	4 95	E b N	h	E b S	h	R		?	2 46	3 41	3 80	3 95	4 29	4 48	4 05	4 05	4 35	4 55	4 29	4 41	3 80	3 85	3 23	?		681 0	4 05	Lower
	8·1	54	00	17	95	7	5 70	4 95	..	0	..	0	W		2 50	3 41	3 61	3 70	3 95	4 17	4 35	4 22	4 11	4 35	4 69	4 22	3 90	3 80	3 66	3 37	2 59		671 4	4 00	
	"	54	00	17	95	7	"	"	E	h	E	h	R		2 11	3 12	3 57	3 52	3 94	4 00	4 41	4 34	4 16	3 99	4 22	4 11	3 94	3 67	3 57	3 33	2 70		690 1	4 11	
	9 1	54	00	17	95	7	5 75	4 95	E	18	NE	4	R		2 13	3 09	3 45	3 66	4 00	4 11	4 29	4 41	4 55	4 41	4 55	4 29	4 17	3 85	3 75	3 19	2 56		674 6	4 02	
	"	54	·00	17	95	·7	"	"	E	27	E	14	W		2 33	2 97	3 57	3 85	4 05	4 05	4 17	4 17	4 35	4 05	4 29	4 22	3 95	3 66	3 53	2 86	2 22		701 0	4 17	
δ Range.		·16	.	15	15	1 2	05	·10	..	.	..	.	.	?	? 61	1 07	67	38	61	65	59	50	65	62	52	24	51	·44	52	51	? 54	?	46 5	27	
ν Means of 10		9·59	.	10 19	8 94	168 4	5 73	4 92	ESE 8					?	?2 24	3 09	3 52	3 75	4·03	4 19	4 43	4 27	4 24	4 25	4 30	4 21	4 05	3 78	3 61	3 11	?2 25	?	685 2	4 08	

TABLES XXXIV.—LVI.

Mean Velocities and Cubic Discharges

		Series		Tables
Soláni Left Aqueduct Site,	...	Series 101 to 107,	Tables	XXXIV, XXXV
Solání Right Aqueduct Site,	...	„ 108 to 127,	„	XXXVI.—XL.
Solaní Right Aqueduct Site, with Left Aqueduct closed		„ 131 to 139,	„	XLI
Solání Embankment Main Site, high water,		„ 151 to 166,	„	XLII—XLV.
Solání Embankment Main Site, low water,		„ 167 to 181,	„	XLVI.—XLVIII
Fifteenth Mile Sites, Old Site,		„ 191 to 195,	„	XLIX
Fifteenth Mile Sites, New Site,		„ 196 & 197,	„	XLIX
Belra Site,		„ 201 to 206,	„	L, LI
Jaolí Site,		„ 211 to 217,	„	LII, LIII
Kambera Site,	. .	„ 221 to 225,	„	LIV, LV
Distributaries,	. .	„ 231 to 238,	„	LVI.

[illegible]

for each Column, viz —

δ Range of (i. e., difference between the greatest and least of) the quantities in the column

v Mean of the quantities in the column

Explanation of the Columns

Col.	Symbol.	Detail
2	A H R δ t S A	[illegible] Area of wet section
3	F_1 F_2 F_3 S	Fall of water surface in upper part of the Reach Fall of water surface in middle part of the Reach. Fall of water-surface in lower part of the Reach Local Surface-Slope, (3 decimals, i. e., 000 to be prefixed by reader)
4		Direction (referred to the current axis as N S line) and Velocity (in feet per second) of the Wind at beginning and end of each Exp.
5		Initial of the Timekeeper
6	u_y H_y	[illegible] each being the mean of six Soundings along a Float-Course Range of the above, i. e., difference between the greatest and least of the six soundings along a Float-Course } Distributaries Table LVI
7	D	Cubic Discharge through the whole section (in cub. ft. per sec.), computed from the velocity-data of Col. 6
8	V	Mean velocity through the Section, computed as the quotient Discharge — Area.
9		Average amount of Silt from surface to bed, at mid-channel, (in grains per cub. ft.,) given for the Belra Site only

TABLE XXXIII.

SURFACE VELOCITIES AND DISCHARGES.

Solání Embankment Minor Sites

[*Instrument—3" Surface Floats*]

N B —This work at two Sites of very similar Cross Section (see Plate XXVIII) combined into one series.

6. Surface Velocities past each vertical

N B The Surface Discharge is computed for 168' breadth throughout

[Each Velocity is the mean of three observations]

Serial No.	1 Date, 18 5	2 Depth Above Datum A	2 Depth Variation	2 Depth Central H	2 Depth Solání Aqueduct Gauge	Surface-Breadth b	3 Fall of Water-Surface Upper 5 miles F₁	3 Fall of Water-Surface Lower 4½ miles F₂	4 Wind From Direction	4 Wind From Velocity	4 Wind To Direction	4 Wind To Velocity	5 Timekeeper's Initial	6 Left of centre 84	82	80	75	70	65	60	40	20	Centre	Right of centre 20	40	60	65	70	75	80	82	84	7 Surface Discharge in sq feet per sec D	8 Mean Surface Velocity U₀	9 Upper or Lower Sites
Series 60.	13 1	9 70	00	10 28	9 00	168 7	5 70	4 90	SW	12	SE	10	W	Assumed zero in computing D	2 22	3 19	3 45	3 75	4·05	4 35	4 55	4 35	4 35	4 41	4 17	4 05	3 90	3 61	3 33	3 06	2 34	Assumed zero in computing D	684 6	4 08	Upper.
	14 1	70	00	28	·00	7	5 70	4 95	SW	12	·	0	W		2 27	3 26	3 57	3 85	4 11	4 55	4 61	4 05	4 55	4 29	4 41	4 22	4 05	3 85	3 53	3 26	2 22		707 9	4 21	
	„	68	− 03	26	8 97	7	5 73	4 92	SW	12	W	27	R		2 50	3 53	3 90	3 90	4 41	4 35	4 17	4 29	4 32	4 11	4 22	4 17	4 00	3 80	3 53	2 88	2 27		678 3	4 04	
	15-1	55	·00	13	85	167 5	5 75	4 85	NE	12	E b N	8	W		2 17	3 13	3 45	3 75	4 00	4 17	4 76	4 55	4 17	4 61	4 48	4 22	4 17	4 05	3 85	3 03	2 22		701 8	4 18	
	„	·55	00	13	85	5	„	„	NE	12	S b E	4	R		1 89	2 78	3 25	3 70	3 80	3 90	4 55	4 29	3 90	4 17	4 17	4 29	4 00	3 70	3 53	2 91	2 16		661 4	3·94	
	7·1	54	00	17	95	168 7	5 75	4 95	E b N	h	E b S	h	R		?	2 46	3 41	3 80	3 95	4 29	4 48	4 05	4 05	4 35	4 35	4 29	4 41	3 80	3 85	3 23	?		681 0	4 05	Lower
	8-1	54	·00	·17	95	7	5 70	4 95	..	0	..	0	W		2 50	3 41	3 61	3 70	3 95	4 17	4 35	4 22	4 11	4 35	4 69	4 22	3 90	3 80	3 66	3 37	2 59		671 4	4 00	
	„	54	00	17	95	7	„		E	h	E	h	R		2 11	3 12	3 57	3 52	3 94	4 00	4 41	4 34	4 16	3 99	4 22	4 11	3 94	3 67	3 57	3 33	2 70		690 1	4 11	
	9·1	54	·00	17	95	7	5 75	4 95	E	18	NE	4	R		2 13	3 09	3 45	3 66	4 00	4 11	4 29	4 41	4 55	4 41	4 55	4 29	4 17	3 85	3 75	3 19	2 56		674 6	4 02	
	„	·54	00	17	95	7	„	„	E	27	E	14	W		2 33	2 97	3 57	3 85	4 05	4 05	4 17	4 17	4 35	4 05	4 29	4 22	3 95	3 66	3 53	2 86	2 22		701 0	4 17	
δ Range.		16		15	15	1 2	05	·10	..	..	..	.	..	?	? 61	1 07	67	38	61	65	59	50	65	62	52	24	·51	44	52	51	? 54	?	46 5	27	
Means of 10		9 59	·	10 19	8 94	168 4	5 73	4 92	ESE 3				..	?	? 2 24	3 09	3 52	3 75	4·03	4 19	4 43	4 27	4 34	4 25	4 36	4 21	4 05	3 78	3 61	3 11	? 2 25	?	685 2	4·08	

TABLES XXXIV.—LVI.

MEAN VELOCITIES AND CUBIC DISCHARGES.

Soláni Left Aqueduct Site, ...	Series 101 to 107,	Tables XXXIV, XXXV.
Soláni Right Aqueduct Site, ...	„ 108 to 127,	„ XXXVI—XL.
Soláni Right Aqueduct Site, with Left Aqueduct closed	„ 131 to 139,	„ XLI.
Soláni Embankment Main Site, high water,	„ 151 to 166,	„ XLII.—XLV.
Soláni Embankment Main Site, low water,	„ 167 to 181,	„ XLVI.—XLVIII.
Fifteenth Mile Sites, Old Site,	„ 191 to 195,	„ XLIX
Fifteenth Mile Sites, New Site,	„ 196 & 197,	„ XLIX
Belra Site, ...	„ 201 to 206,	„ L., LI
Jaolí Site, ...	„ 211 to 217,	„ LII., LIII.
Kambera Site, ...	„ 221 to 225,	„ LIV, LV.
Distributaries, ...	„ 231 to 238,	„ LVI.

[illegible] cution, the work of different days is arranged generally by order of depth of water. [illegible] 238 those done at the same Site fol[illegible] depth of water; the gaps in the num[illegible]

[illegible] Series contain the following quantities for each Column, viz —

δ ' Range of (i. e., difference between the greatest and least of) the quantities in the column.
ε Mean of the quantities in the column.

Explanation of the Columns

Col.	Symbol.	Detail.
2	A H	[illegible]
	R b i	[illegible]
	B A	Area of wet section [illegible]
3	F_1	Fall of water surface in upper part of the Reach.
	F_2	Fall of water surface in middle part of the Reach.
	F_3	Fall of water surface in lower part of the Reach.
	S	Local Surface Slope, (3 decimals, i. e., 000, to be prefixed by reader).
4		Direction (referred to the current-axis as N S. line), and Velocity (in feet per second) of the Wind, at beginning and end of each SET.
5		Initial of the Timekeeper
6	v_y	Rod velocities past the several verticals whose distances (y) from mid-channel are specified at the head of each sub-column, each entry being the mean of three observations.
	H_y	Average Soundings for the several verticals whose distances (y) from mid-channel are specified at the head of each sub column, each being the mean of six Soundings along a Float-Course " Range of the above, i. e. difference between the greatest and least of the six soundings along a Float-Course. given only for the Distributaries, Table LVI.
7	D	Cubic Discharge through the whole section (in cub ft. per sec), computed from the velocity-data of Col. 6.
8	V	Mean velocity through the Section, computed as the quotient Discharge — Area.
9		Average amount of Silt from surface to bed, at mid-channel, (in grains per cub. ft.,) given for the Belra Site only

MEAN VELOCITIES

SOLANI LEFT

[*Instruments—Nos* 101, 103 1" *tin Tube Rods,*

	1	2					3			4				5				
		DEPTH					FALL of Water-Surface.			WIND.					MEAN past (Each Velocity Left of			
										From		To						
Serial No.	Date 18 5 8 79	Central H	Variation	Hyd Mean R	Surface-Breadth b	Length of Rod l	Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	42½	39½	37½	35
101	14-12-'78	10·00	− 03	7 99	82·0	9	5 9ɔ	5·57	18.	NE	4	S	9	Cl	?o	?	3 66	3 95
	19- ,,	9·87	− 03	91	·0	9	5 93	5·47	100	SE	?	NE	5	C	?o	3 53	3 68	3·90
	20- ,,	83	− 01	92	·5	9	5 87	5·43	195	··	0	W	3	Cl	?o	3 57	3·85	3 95
δ Range.		17		03	3	0	03	14	01	·	·		·		?	? 04	19	05
ε Means of 3		9·90	··	7 94	82 2	9	ɔ 97	5·49	18	SE ½ E 1					?	3 05	3·73	3 93
Series 102	2-4-'75	9 "ɔ	00	7·86	82 5	9	ɔ ɔ5	ɔ55	Not observed		?0	?	?0	B	Assumed zero in computing Discharge	Not observed	3 19	3 ɔ0
	,, ,,	75	00	·86	5	9	,,			?	?0		0	W			3·06	3 21
	31-3 ,,	70	00	83	·5	9	5 60	5·50		·	0	?	?0	B			3 45	3 53
	,, ,,	70	00	·83	·5	9				?	?0		0	W			3 17	3 26
	1-4- ,,	"0	·00	·53	ɔ	9	5·60	5·50			0	?	?0	B			3·03	3 50
	,, ,,	70	00	83	5	9	,,	,,		?	?0	v	20	W			3 09	3 28
	30-3-	65	·00	80	5	9	5 65	5 45			0		0	B			3 30	ɔ 30
	,, ,,	·65	00	80	5	9	,,	,,		·	0		0	W			3 2?	3 28
	29-3- ,,	50	00	70	5	9	5·60	5 ɔ0			0	·	0	B			3 23	3 26
		·ɔ0	00	70	·5	9	,,	,,		·	0		0	W			3 14	3 31
	3-4- ,,	50	00	70	5	9	5·6ɔ	5·40			0	?	r	B			3 19	3 23
	, ,,	·50	00	·70	·5	9	,,	·		?	?0		0 0	W			3 30	3·23
δ Range.		25		16	0	0	25	25	·	·		·	·		?		39	·34
ε Means of 12,		9·63		7 79	82·5	9	5·64	5·45	·	? Calm					?		3 20	3·29
Series 103.	23-5-'78	9·45	00	7·69	82·5	9	5·97	5·18	20ɔ	W	6	NW	7	B	?o	3 4	3 75	3·66
	12-4- ,,	·41	+ 12	·65	·5	9	5 99	4 71	19	SE ½ S	7	NE	8	B	?o	3 5	3 ·0	3 80
	27-5- ,,	40	00	·64	·5	9	5 90	5 10	210	SW ½ W	8	SW	8	T	?o	3 37	3 49	3 75
	15-4-'79	·37	+ ·03	·62	·5	8½	5 85	5·22	215	NW	4	SW	17	B	?o	3 41	3 41	3 57
δ Range.		11		07	0	5	16	51	01.		·	·	·		?	20	·34	23
ε Means of 4,		9·42		7 65	82·5	8	5 91	5·05	20	SW ½ W 3					?	3·46	3·59	3·70

AQUEDUCT.

No 102. 2½" *wood Rods*]

6															7	8
VELOCITIES each vertical is the mean of three observations															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre				Centre	Right of centre											
32½	30	20	10		10	20	30	32½	35	37½	40	41½	41¾	42½	D	V
4·11	4·05	4·11	4 38	4 44	4 41	4 35	4 22	4 29	4 22	4 00	4·05	3 90	3 57	?0	3,429	4·03
3 92	4 14	4 11	4 29	4 10	4 22	4 32	4 29	4 08	4 11	3 95	3 90	3·85	3 26	?0	3,409	4·04
3·90	4 11	4 38	4 41	4 29	4 41	4 11	4 22	4 14	4 22	4 22	3 80	3 59	3 23	?0	3,441	4·12
·21	·09	27	·12	·24	·18	24	07	21	·11	27	25	31	·34	?	32	·09
3 98	4 10	4 20	4 36	4·31	4 35	4 26	4·24	4 17	4 18	4 06	3 92	3 78	3·85	?	3,427	4 06
3 26	3 45	3 45	3 75	3 75									Not obser	Assumed one in computing Discharge.	2,890	3 49
3 33	3 37	3 64	3 64	3·82											2,875	3 47
3 53	3 70	3 75	3 66	3 85											3,005	3 64
3 61	3 73	3 77	3 87	3 64											2 915	3 54
3 30	3 49	3 61	3 66	3 57	3 95	3 75	3 57	3 80	3 61	3 61	3 41	3 06			2 876	3 49
3 37	3 33	3 59	3 73	3 70	3 68	3 85	3 66	3 77	3 73	3 73	3 39	3 33			2,915	3 53
3 49	3 57	3 66	3 85	3 70	3 80	3 90	3 95	3 80	3 55	3 57	3 53	3 23			2,954	3 60
3 37	3 53	3 87	4·00	3 66	3·90	3 80	4 05	3·95	3 64	3 66	3 77	3 30			2,974	3 63
3 49	3 61	3 80	3 95	4 00	3 90	4 00	3·85	3 85	3 70	3 61	3 61	3 26			2,995	3 72
3 57	3 51	3 80	3 90	3 91	4 03	4 03	4 00	4 08	3 95	3 90	3 66	3 39			3,013	3 73
3 41	3 41	3 80	3 75	3·37	3·61	3 70	3 61	3 75	3 70	3 70	3 33	3 13			2,804	3 47
3 26	3 43	3 73	3·77	3 85	3 55	3 47	3 61	3·82	3 77	3 57	3 64	3·00			2,844	3·52
·35	·40	·42	·36	63	·50	60	48	·38	·40	·43	·44	·39	..	7	209	·26
3·42	3 51	3·71	3 79	3 74	3 76	3 76	3·76	3·82	3·71	3·64	3 50	3 21	..	?	2,922	3 57
3·85	3 77	4 11	3 95	3 75	3 85	4 00	4 20	4 17	3 97	3 85	4 03	3·55	3 19	?0	3,107	3 86
3 80	3·85	3 90	4·05	3 90	4 29	4 00	4 22	4 22	4·00	3 90	4 05	3 45	3·66	?0	3,107	3·88
3 70	3 85	4 05	4 05	4 17	4 11	4 00	4 00	4·00	4 05	3 85	3 85	3 41	3·00	?0	3,126	3·91
3 75	3 70	3 80	4·05	4·00	4 11	3·95	4 00	4 00	4 00	3·90	3 49	3 49	3·00	?0	3,034	3·82
15	15	·31	10	·42	·44	·05	·22	·22	·08	·05	·56	·14	66	?	92	·09
3·78	3 79	3·97	4 03	3 96	4·09	3·99	4 11	4·10	4·01	3·88	3·86	3·48	3·21	?	3,093	3·87

MEAN VELOCITIES

SOLANI LEFT

Instruments—No 104 2½" *wood Rods*

Serial No	1	2					3			4				5				
	Date 1875-77 78	DEPTH			Surface Breadth	Length of Rod	FALL of Water Surface			WIND				Timekeeper's Initial	MEAN past Each Velocity Left of			
		Central	Variation	Hyd Mean			Upper 5 miles	Lower 4½ miles	Local Slope	From Direction	From Velocity	To Direction	To Velocity		42½	39½	37½	35
		H		R	b	l	F_1	F_2	S									
Series 104	23-3 78	9 15	00	7 53	83 4	8½	5 65	5 10	Not observed		0	?	?0	R	Assumed same as computing Discharge	3 39	3 45	3 57
		15	00	53	4	8½				?	?0		0	W		3 37	3 49	3 53
	24 3-	15	00	53	4	8½	5 65	5 15			0	?	?0	R		3 41	3 45	3 61
		15	00	53	4	8½	"			?	?0		0	W		3 33	3 53	3 59
	22 3-	10	00	50	5	8½	5 60	5 10			0	?	?0	R		3 4	3 45	3 61
		10	00	50	5	8				?	?0		0	W		3 39	3 43	3 59
	25 3-	10	00	50	5	8	5 70	5 15			0	?	?0	R		3 49	3 53	3 80
	" "	10	00	50	5	8½				?	?0	N	20	W		3 43	3 63	3 61
	19 3	8 90	00	38	7	8½	5 60	5 00			0		0	R		3 53	3 45	3 57
	20 3	00	00	38	7	8	5 80	5 10			0	?	?0	W		3 28	3 5	3 41
	"	90	00	38	7	8				?	?0		0	R		3 3	3 6	3 61
		90	00	38	7	8½	5 90				0		0	W		3 47	3 41	3 61
δ Range,		25		15	3	0	30	15							?	21	27	39
v Means of 12,		9 05		7 47	83 5	8 5	5 70	5 12		? N 1					?	3 89	3 50	3 59
105	6-4 78	8 67	00	7 23	84 0	8	5 93	4 74	225	NW	?	W	6	T	?0	3 41	3 45	3 57
	20-3	54	– 12	14	1	8	5 66	4 51	218	SW	?		0	R	?0	3 30	3 37	3 75
δ Range		13		09	1	0	07	20	007						?	11	08	18
v Mean of 2,		8 61		7 19	84 0	8	5 89	4 64	?2	W b N ?					?	3 36	3 41	3 66
Series 106	21 3- 78	8·19	00	6 90	85 0	7½	5 81	4·39	220	SE	3		0	T	ϕ in computing D	3 35	3 33	3 37
	12 3	00	00	77	·0	7½	5 85	4 20	210	SE	6	SE	2	T		3·06	3 19	3·33
	5 3 77	00	00	77	0	7½	5 90	4 30	?	S	6	V	?	P		3 33	3 26	3 53
	6 3	7 98	00	75	·0	7½	5 92	4 28	188		0		0	W		3 23	3 43	3 51
	23 ?	97	00	75	0	7	5·98	4 17	?	S	13	S	17	W		3·06	3 31	3 35
	23 3-	97	00	75	0	7½	5·83	4 27	?	V	?	V	?	P		3 09	3 28	3 41
δ Range,		22		15	0	0	17	22	?032						?	27	24	20
v Means of 6,		8·02		6 78	85·0	7	5 88	4 27	?200	S b E 4					?	3 18	3·30	3·42
Series 107	9-3- 78	7 56	+ 02	6 46	85·0	7	5 89	3 96	220		0	N	?	T	ϕ in computing D	3·23	3 30	3 33
	8-3- "	53	– ·03	43	0	7	5·92	3 93	22	SW	9	NW	4	R		3 16	3 26	3 61
	11 3 "	51	00	42	·0	7	5 94	3 91	23		0		0	R		3 19	3 37	3 37
	7 3-	50	00	41	0	7	5 90	3 90	22	S	6		0	T		3 13	3 37	3 33
	21 2- 77	48	00	40	0	7	6·02	3 98	?	V	9	V	9	P		2 91	3·06	3 26
	15-3- "	43	·00	·36	·0	7	5·87	3·93	?	S	4	N	7	W		3 17	3 35	3 43
δ Range,		13		10	0	0	15	08	?015						?	32	31	35
v Means of 6,		7 50		6·41	85 0	7	5·92	3 94	?22	WSW 1					?	3·13	3 27	3 33

AQUEDUCT

Nos 105 *to* 107. 1" *tin Tube-Rods.*

6															7	8
VELOCITIES each vertical is the mean of three observations).															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre				Centre	Right of centre											
32½	30	20	10		10	20	30	32½	35	37½	40	41½	41¾	42½	D	V
3 45	3 66	3 75									3 45	3·09	Not observed	Assumed zero in computing Discharge	2 763	3 55
3 10	3 59	3 85									3 49	3 21			2 873	3·69
3 70	3 70	3 75									3 45	3 03			2 811	3 61
3 66	3 75	3 55									3 45	3 06			2 807	3 61
3 0	3 80	3 75									3 41	?			2 747	3 63
3 66	3 80	3 77	3 90	3 90	3 66	3 75	3 77	3 75	3 64	3 66	3 31	?			2 780	3 68
3 61	3 66	3 80	3 0	3 80	3 53	3 90	3 49	3 80	3 57	3 66	3 33	3 13			2 844	3 67
3 82	3 70	3 66	3 87	3 68	3 87	3 59	3 59	3 66	3 61	3 64	3 47	3 21			2 783	3 60
[illegible]	3 57	3 61	3 50	3 53	3 57	3 75	3 70	3 61	3 61	3 57	3 41	?			2 671	3 53
3 68	3 77	3 61	3 68	3 85	3 70	3 75	3 64	3 57	3 64	3 57	3 31	?			2 726	3 60
3 61	3 75	3 61	3 75	3 10	3 70	3 85	3 70	3 66	3 66	3 61	3 49	?			2 731	3 61
3 66	3 57	3 77	3 73	3 77	3 85	3 55	3 66	3 68	3 64	3 59	3 59	?			2,720	3 59
37	23	30	24	·47	42	67	43	23	20	13	28	? 18	.	?	202	16
3 65	3 69	3 71	8 77	3 80	3·72	3 66	3 67	3 67	3 63	3 60	3 46	?3·12		?	2,771	3 61
3 85	4 05	3 80	3 80	3 95	4 00	3 90	4 00	3 85	3 90	3 53	3 53	3 2	3 00	?0	2 781	3 78
3 66	3 57	3 61	3 90	3 66	3 95	3 80	3 61	3 80	3 66	3 80	3 70	3 33	2 94	?0	2,629	3 62
19	48	19	10	29	05	10	39	05	24	27	17	10	06	?	152	16
8 76	3·81	3·71	3 80	3 81	3 98	3 85	8 81	8 83	8 78	3 67	3 62	3 28	2 97	?	2,705	3 70
								3 61	3 66	3 61	3 61	3 26	2 94	0 in computing D	2,46	3 54
								3 66	3 80	3 41	3 5	3 13	2 94		2,377	3 50
								3 59	3 51	3 59	3 30	2 96			2 368	3 48
								3 37	3 31	3 37	3 13	3·08	?		2 328	3 43
								3 51	3 53	3 43	3 33	2 93	?		2 390	3 54
								3 37	3 47	3 39	3 37	3 09	?		2,227	3 34
·25	30	36	71	27	31	52	18	29	49	24	48	33	?	?	236	20
3 53	3 62	3 60	3 59	3 61	3·53	3 51	3 51	3 52	3 55	3 47	3 38	3·08	?2 94	?	2 361	3 47
3 49	3 70	3 57	3 53	3 66	3 06	3 41	3 57	3 49	3 53	3 37	3 45	3 16	3 06	0 in computing D	2,230	3 47
3 61	3 53	3 61	3 53	3 37	3 70	3 61	3 90	3 61	3 66	3 49	3 53	3 26	3 13		2,226	3 48
3 45	3 31	3 61	3 45	3 57	3 30	3 61	3 66	3 10	3 41	3 26	3 30	3 13	2 78		2,211	3 46
3 53	3 33	3 45	3 37	3 61	3 57	3 41	3 37	3 61	3 70	3 70	3 41	3 16	3 00		2 183	3 42
3 28	3 41	3 55	3 37	3 41	3 45	3 51	3 43	3 41	3 43	3 37	3 17	2 88	?		2 131	3 35
3 39	3 41	3 45	3·66	3 59	3 55	3 66	3 24	3 23	3 35	3 14	3 08	2 87	?		2,102	3 41
33	37	16	29	29	40	25	66	47	35	56	45	39	? 35	?	99	13
3 46	3 46	3·54	3 49	3·54	3 54	3 54	3 53	3·51	3·51	3 39	3 32	3 08	?2·99	?	2,16	3 43

MEAN VELOCITIES

SOLÁNÍ RIGHT

[*Instruments*—1″

Serial No	Date, 1876 77 78	2 Depth Central. H	Variation.	Hyd. Mean. R	Surface-Breadth. b	Length of Rod l	3 Fall of Water-Surface Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind From Direction.	Velocity.	To Direction.	Velocity	5 Timekeeper's Initial	Mean past (Each Velocity Left of 42½	41⅞	41¼	40
Series 108.	31-5-'77	10 01	− 02	8 00	82·0	9¼	5 89	5 66	189	..	0	NE	3	W	Assumed zero in computing Discharge	Not observed.	3 41	3 64
	30-5- ,,	00	00	7 99	·0	9½	5 90	5 65	?	S	4	SSW	12	P			3 33	3 80
	1-6- ,,	00	00	99	·0	9¼	5 90	5 70	?	..	0	SE	8	P			3 53	4·00
	,, ,,	00	00	·99	·0	9¼	,,	,,	?	SE	3	E	11	W			3 30	3 66
	4 6- ,,	00	+ 02	99	0	9½	5 86	5 60	?	S	6	NE	10	P			3 30	3 70
	5-6 '76	00	00	99	0	9	5 80	5 70	185	..	0	S	5	W			3 66	4 00
	17 8- ,,	9 98	00	97	0	9	5 87	5 68	195	NE	6	NE	14	W		3 28	3 57	3 97
	14-6- ,,	·97	+ 02	97	·0	9	5 83	5 67	190	NE	6	NW	8	H		3 21	3 49	3 92
	14-12-'78	98	00	·97	0	9	5 97	5·55	173	S	9	?	?	Cl		3 13	3 31	3 75
	6-6-'77	98	00	·97	0	9¼	5 82	5 68	191	SW	7	N	6	W		Not observed.	3 37	3 61
	6-6- ,,	98	00	·97	·0	9¼	5·82	5 58	186	..	0	..	0	P			3 43	3 70
	7-6- ,,	97	00	97	·0	9¼	5 83	5 57	?	NE	7	W	5	W			3 47	3 64
	,, ,,	97	00	97	0	9¼	,,	,,	?	W	5	N	4	P			3 33	3 75
	5-6- ,,	96	+ 01	·96	·0	9¼	5 74	5 61	?	N	7	W	4	W			3 31	3 66
	,, ,,	97	+ 01	97	0	9½	5 73	5 62	?	W	4	S	7	P			3 26	3 64
	17-5-'76	87	− 03	90	0	9	5 83	?	180	..	0	NE	7	W			3 35	3 73
	,, ,,	85	00	·89	·0	9	5 85	?	,,	NE	7	N	9	H			3 30	3 75
	19-12-'78	87	00	90	·0	9	5 93	5 47	200	NE	8	NE	7	C		3 06	3 19	3 68
	20-12- ,,	82	+ 02	·91	·5	9	5·88	5 42	205	W	4	SW	12	Cl		3 13	3 24	3 92
δ	Range,	19	..	·11	·5	5	24	28	?030	..	..	..	..	..	?	? 22	·61	39
ν	Means of 19,	9 96	..	7 96	82 0	9 3	5 86	5 61	?189	NEbE 1				..	?	?3 16	3 41	3 76
Series 109.	29-7-'78	9 68	+ 05	7 82	82 5	9	6·07	5 23	198	..	0	SbW	5	R	Assumed zero in computing Discharge.	3 49	3 68	4 17
	2-5-'77	·65	00	·80	·5	9	5·85	4 95	?	E	7	N	18	P		?	3 41	3 49
	3-5- ,,	·65	00	80	·5	9	5·80	4 95	190	NE	6	..	0	W		?	3 23	3 61
	,, ,,	·65	00	80	·5	9	,,	,,	,,	NE	12	N	10	P		?	3 23	3 85
	14-11- ,,	64	+ 02	·79	5	9	6·16	5·14	?	S	4	S	5	G		3 37	3 55	3 87
	,, ,,	66	+ 02	81	·5	9	6·14	5 16	?	S	5	SSW	13	P		3 57	3 57	4 08
	1-6-'76	65	− 04	80	5	9	5 85	5 45	?	S	8	NE	9	W		?	3 49	3 95
	19-11-'77	·63	00	·79	·5	9	6 07	5·28	203	W	7	..	0	G		3 53	3·68	3 90
	,, ,,	63	·00	79	5	9	,,	,,	,,	W	5	NW	9	P		3 85	3 61	4 08
	15-5-'76	·63	·00	·79	5	9	5·82	5 43	185	..	0	..	0	H		Not observed.	3 23	3 77
	,, ,,	63	·00	79	·5	9	,,	,,	,,	..	0	..	0	W			3 41	3·92
	11-5- ,,	·63	− 05	79	·5	9	5 82	5 43	195	..	0	..	0	W			3 19	3·68
	,, ,,	·68	− 05	·76	5	9	5 87	5 38	,,	..	0	..	0	H			3 19	3 64
	12-5- ,,	·60	00	77	·5	9	5 80	5 40	190	NE	11	NE	17	W			3 39	3 80
	3-6- ,,	·56	−·12	75	·5	9	5 94	5·36	186	..	0	NE	10	W			3 45	3 77
	2 6- ,,	·52	− 04	·72	·5	9	5 73	5·32	195	E	5	NE	9	H			3 45	3·68
	16-5- ,,	·50	00	·70	·5	9	5·85	5 35	195	..	0	NE	10	H			3·19	3·77
	12-4-'78	61	00	·71	·5	9	5·89	4·81	190	W	12	E	22	R		3 13	3 30	3 70
δ	Range,	·18	..	·12	·0	0	·43	·64	?015	..	..	..	..	..	?	?·72	·49	·68
ν	Means of 18,	9·61	..	7 78	82 5	9	5 91	5 24	?193	NEbE 3				..	?	?3·49	3·40	3 82

TABLE XXXVI.

AND CUBIC DISCHARGES.

Aqueduct

in Tube-Rods]

6															7	8
VELOCITIES each vert.cal is the mean of three observations).															Cubic Discharge in cub feet per sec	Mean Velocity
centre						Centre	Right of centre.									
37½	30	22½	20	10	[illegible]		10	20	30	32½	35	37½	39½	42½	D	V
3 85	3·97	4 11	3 85	3 82	4 12	4 27	3 87	4 26	4 21	3 92	3 85	3 77	Not observed	Assumed zero in computing Discharge.	3,328	3 92
3 85	4·05	4 00	4 17	4 26	4 20	4 12	4 05	4 22	4 05	3 95	3 73	3 70			3 380	3 98
3 59	3 90	4·03	4·00	4 08	4 17	4 22	4 00	4 27	4 17	4 08	3 73	3 66			3 364	3 96
3 81	3 77	3 90	3 97	4 11	4 22	3 90	4 08	4 21	4 00	3 95	3 87	3 53			3 287	3 87
3 91	3 91	4·05	4 08	4 21	3 95	4 26	4 35	4·27	4 05	3 92	3 82	3 53			3 377	3 97
4 08	4 17	4 32	4 22	3 9	4 26	4 20	4 14	3 90	3 92	4 08	3 75	3 61			3,310	3 93
4 29	4 29	4 32	4 38	4 35	4 17	4 41	4 11	4 22	4 21	4 00	3 82	3 82	3 49		3,528	4 16
4 03	4 26	4 22	3 95	4 44	4 29	4 30	4 32	3 90	4 00	3 80	3 73	3 64	3 30		3 424	4 04
4 20	4 35	4 48	4 61	4 35	4 55	4 41	4 41	4 69	4 35	4 11	4 05	3 90	3 80		3 601	4 21
3 97	4 11	4 17	4 08	4 14	4 14	4 29	3 85	4 20	3 95	3 92	3 87	3 59	Not observed		3 380	3 99
3 91	4 26	4 20	4·00	4 17	4 22	4 14	3 97	4 11	4 05	3 77	3 92	3 59			3 355	3 96
3 73	4 05	4 03	4 00	4 08	4 22	4 11	4 05	4 26	3 92	3 95	3 80	3 53			3 330	3 94
3 80	4 03	4 17	4 11	4 32	3 92	4 05	4 17	4 12	4 17	3 90	3 80	3 68			3,305	3 96
4 08	4 12	3 80	3 95	3 80	4 03	4 29	4 29	3 90	4 12	3 92	3 75	3 70			3 283	3 88
3 81	3 77	3 92	4 00	4 0	3 95	4 05	4 32	3 97	3 85	3 92	3 75	3 70			3,204	3 85
3 95	4 17	4 29	4 20	4 14	4 11	4 20	4 20	3 97	4 05	3 85	3 75	3 61			3 313	3 95
4 32	4 14	4 26	4 11	4 20	4 44	4 26	4 08	4 05	4 11	3 82	3 73	3 45			3 308	4 00
4 00	4 14	4 44	4 32	4 41	4 55	4 22	4 32	4 08	4·03	4 11	4 03	3 [illegible]0	3 59		3 444	4 11
4 20	4 20	4 32	4 35	4 48	4 29	4 35	4 29	4 35	4 29	4 17	4 05	3 85	3 66		3,519	4 22
73	58	68	76	68	63	51	56	79	50	40	32	45	? 50	?	337	45
3 98	4 09	4 16	4 12	4 17	4 20	4 21	4 16	4 14	4 07	3 95	3 83	3 60	?3 57	?	3,384	4·00
4 26	4 41	4 44	4 48	4 69	4 65	4 69	4 48	4 48	4 08	3 95	4 12	3 80	Not observed.	Assumed zero in computing Discharge.	3,577	4 35
3 90	4 11	3 92	3 95	4 26	4 03	3 95	4 00	3 90	4 08	3 85	3 75	3 75			3 176	3 87
3 77	3 80	3 00	3 00	4 08	4 14	3 80	4 08	3 8	3 9[illegible]	3 85	3 8	3 61			3 104	3 [illegible]8
															3 071	3 [illegible]4
															3,511	4 26
															3 425	4 17
															3 227	3·93
															3 376	4 12
															3 378	4 13
															3 15	3 86
															3 164	3 87
															3 163	3 83
															3,15	3 88
															3 133	3 84
4·00	4 03	4 0[illegible]	3 97	4 00	4 24	3 92	4 08	4 20	3 87	3 85	3 64	3 47			3,141	3 87
4 08	4 17	4 00	4 20	4 38	3 95	4 05	4 24	3 80	3 80	3 73	3 66	3 45			3,14	3 89
3 90	4 14	4 05	3 90	3 97	3 90	4·05	4 00	3 82	3 82	3 80	3 57	3 49			3 064	3 79
4 05	4 17	4 17	4 35	3 95	4 00	4 05	4 27	4 00	4 17	3 90	3 70	3 75	3·85	..	3,196	3·95
58	61	54	71	84	85	89	61	63	57	59	60	69	?	?	513	61
4·02	4 11	4 13	4 13	4·18	4 14	4 16	4 17	4·04	4·02	3 86	3·77	3 59	?3 8[illegible]	?	3,231	3·95

MEAN VELOCITIES

Soláni Right

[*Instruments*—{ *No.* 110. 1″ *wood Rods till* 8-5-'76,
No. 111. 1″ *tin Tube-*

	1	2					3			4				5				
		Depth.					Fall of Water-Surface			Wind.					Mean past [Each Velocity Left of			
										From		To						
Serial No	Date 1876 77 78 79	Central H	Variation.	Hyd. Mean R	Surface-Breadth b	Length of Rod l	Upper 5 miles. F_1	Lower 4½ miles. F_2	Local Slope S	Direction.	Velocity	Direction.	Velocity	Timekeeper's Initial	42½	41¾	41½	40
Series 110.	15 4-'79	9 42	+ 05	7 65	82 5	8¾ 9	5 76	5 27	200	V	4	SW	12	B	Assumed zero in computing Discharge.	3 06	2 97	3 70
	28 5-'78	42	00	65	5	9	5 98	5 12	188	NW	4	V	4	R		3 06	3 41	3 70
	27-4-'77	41	− 02	65	5	9	5 79	5 20	?	NE	4	N	9	W		?	3 19	3 33
	" "	42	00	65	5	9	5 78	5 27	?	NW	6	NE	4	P		?	3 16	3 37
	8 5 '76	40	00	64	5	9	5 80	5 23	20.	..	0	NE	12	W		?	3 70	3 68
	3 6- "	39	− 22	63	5	9	6 11	5 19	18.	NE	10	N	6	H		?	1 41	3 64
	8 8 '78	39	− 03	63	5	8½	5 21	4 94	203	..	0	..	0	R		3 33	3 75	4 35
	27-5- "	38	00	63	5	9	5 92	5 08	190	S	8	SW	13	T		3 19	3 30	3 75
	1-5-'76	33	− 05	62	8	9	5 82	5 33	19.	..	0	..	0	W		Not observed.	3 41	3 68
	" "	30	·00	61	83 0	9	5 85	5 30	"	..	0	..	0	H			3 53	3 68
	2-5 "	30	00	61	0	9	5 85	5 25	19.	..	0	..	0	W			3 30	3 73
	" "	30	00	61	0	9	"	"	"	..	0	..	0	H			3 30	3 61
	3 5 "	30	00	61	0	9	5 85	5 25	19	..	0	..	0	W			3 39	3 55
	" "	30	00	61	0	9	"	"	"	..	0	.	0	H			3 23	3 47
	28 4 "	27	00	59	1	9	5 78	5 27	190	..	0	..	0	H			3 19	3 64
	29 4- "	25	00	58	1	9	5 80	5 23	190	..	0	..	0	W			3 35	3 64
	" "	25	00	58	·1	9	"	"	"	..	0	..	0	H			3 11	3 42
	" "	25	·00	58	1	9	"	"	"	..	0	..	0	W			3 30	3 49
	" "	25	00	58	1	9	"	"	"	..	0	..	0	H			3 16	3 57
	26-4-'77	25	00	58	1	9	5 75	5 10	183	..	0	N	1.	P			3 09	3 37
δ Range		17	..	07	6	5	46	39	?022	..	..	..	.	..	?	? 27	·78	1 02
υ Means of 20		9 33	..	7 61	82 8	9 0	5 86	5 22	?193	N1					?	?3 16	3 31	3 62
Series 111.	15-11-'77	9 06	+ 16	7 48	83·5	8½	6 34	4 96	?	V	6	V	6	G	Assumed zero in computing Discharge	3 30	3 53	4 05
	25 4-'78	03	00	·46	6	8½	5 87	4 90	193	N	7	V	9	P		2 97	2 99	3 61
	20-4- "	01	00	45	6	8½	5 89	4 91	194	..	0	..	0	B		3 36	3 41	3 51
	" "	02	00	45	6	8½	5 88	4 92	18.	..	0	..	0	R		3·00	3 57	3 66
	26-4- "	00	00	·44	6	8	5 90	4 90	19.	N	9	V	4	P		3·38	3 24	3 37
	12-11-'77	00	·00	44	6	8'	6 05	4 50	?	Y	5	S	16	G		3 19	3 49	3 66
	15 7-'76	8 98	+ 01	43	6	8	5 92	4 95	19.	..	0	E	17	H		3 11	3 61	4 05
	13-11-'77	·96	− 02	42	7	8½	5 01	4 46	182	N	8	..	0	P		3 37	3 53	3 75
	19 2-'76	95	+ 08	41	·7	8	5 75	5 00	?	SW	6	NW	12	H		?	?	3 23
	23-5- "	95	00	41	·7	8	5 85	4 95	195	..	0	SW	4	H		?	3 43	3 68
	24 5- "	·95	00	41	7	8	5 85	?	?	SE	10	NE	10	W		?	3 30	3 57
	" "	95	00	41	7	8	"	?	?	NE	10	V	1.	H		?	3 37	3 73
	25-4-'77	94	·00	40	7	8½	5 76	4 94	?	WSW	4	W	6	P		?	3 21	3 26
	" "	94	·00	40	·7	8½	"	"	?	W	8	SW	7	W		?	2 99	3 43
	14 7-'76	90	00	·38	·7	8	5·90	4 90	20.	..	0	..	0	H		3 35	3 73	3 60
	" "	90	00	38	7	8	"	"	"	..	0	..	0	W		3 30	3 53	4·03
δ Range		·16	..	·10	2	5	59	? 54	?023	..	..	..	.	..	?	? 49	? 74	82
υ Means of 16		8 97	..	7 42	83 7	8 3	5·91	4 87	?19.	NNW 1				..	?	3·17	?3 40	3·63

AND CUBIC DISCHARGES

TABLE XXXVII.

AQUEDUCT

and 1" tin Tube-Rods from 3-6-'76 }]
Rods

6															7	8
VELOCITIES each vert cal is the mean of three observations]															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre						Centre	Right of centre.									
3 ½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	41½	D	V
3 66	4 11	4 00	3 90	3 90	3 80	3 85	4 11	3 90	3 95	3 90	3 85	3 75	3 57		3,047	3 82
3 90	4 17	4 05	3 87	4 29	4 17	4 17	3 90	4 32	3 82	3 97	3 70	3 59	3 57		3 223	4 02
3 53	3 53	3 57	3 70	3 85	3 77	4 00	4 14	3 82	3 77	3 85	3 59	3 41	3 43		29 6	3 70
3 68	3 87	3 82	3 80	3 80	3 80	3 95	4 00	3 90	3 97	3 73	3 51	3 37	3 55		2 976	3 75
4 03	4 17	4 29	4 17	3 80	4 17	4 12	4 20	3 77	3 80	3 92	3 77	3 57	?		3 007	3 83
3 92	4 00	4 08	4 05	4 14	4 03	3 80	4 05	4 08	3 81	3 75	3 53	3 31	?		3 01[illegible]	3 82
4 69	4 84	4 96	4 55	4 38	4 48	4 41	4 35	4 26	3 95	3 82	4 00	3 61	3 53		3 38	4 24
4 00	3 95	4 05	4 11	4 17	4 11	4 00	4 05	4 11	4 11	3 70	3 75	3 57			3 12	3 92
4 03	4 29	4 08	4 22	4 20	4 22	4 00	4 03	3 92	3 92	3 82	3 68	3 41			3 094	3 90
3 82	4 17	4 11	4 17	4 29	4 08	4 08	4 00	3 80	3 80	3 68	3 75	3 41			3 064	3 87
3 90	4 03	3 95	4 00	4 03	4 38	3 95	3 66	3 82	3 80	3 77	3 64	3 43	Not observed	Assumed zero in computing Discharge	2 996	3 79
3 96	4 00	4 20	4 20	4 11	4 22	4 11	4 11	4 03	3 92	3 68	3 51	3 57			3,090	3 91
3 87	3 87	4 22	3 85	4 00	4 00	3 80	4 11	4 08	3 70	3 82	3 57	3 49			3 001	3 80
3 68	3 85	4 00	4 00	3 95	4 03	4 05	3 95	4 05	3 80	3 66	3 66	3 57			3 024	3 82
3 87	4 17	4 05	4 05	3 70	3 80	4 05	4 05	3 82	3 85	3 68	3 53	3 47			2,93[illegible]	3 75
3 85	4 17	4 14	3 92	4 05	3 95	3 95	3 97	3 64	3 82	3 55	3 64	3 31			2 936	3 75
3 75	4 00	4 08	3 77	4 14	3 95	3 90	3 82	3 82	3 98	3 57	3 45	3 28			2 9[illegible]	3 76
3 87	4 00	4 03	4 05	4 03	3 82	3 97	4 14	3 90	3 80	3 80	3 55	3 37			2 987	3 80
3 80	3 75	4 11	4 00	4 05	4 08	3 82	4 05	3 75	3 95	3 80	3 59	3 30			2 939	3 72
3 70	3 85	3 68	3 49	4 00	3 66	3 70	3 87	3 61	3 77	3 70	3 33	3 53	3 37		2,836	3 61
1 16	1 31	1 39	1 06	68	82	71	69	71	41	42	67	47	? 20	.	547	63
3 88	4 04	4 09	3 99	4·04	4 03	3 98	4 03	3 92	3 86	3 76	3 63	3 47	?3 50		3,035	3 83
4 22	4 05	4 11	4 22	4 20	4 17	4 41	4 05	4 22	4 17	4 11	4 08	3 82	3 55		3 055	3 97
3 85	3 64	3 82	3 92	3 87	3·68	3 77	4 05	3 73	4·05	3 85	3·61	3 51	?		2,832	3 69
3 95	3 85	3 97	3 95	3 90	3 95	4 14	3 75	4 11	3 85	3 85	3 66	3 57	?		2 952	3 85
3 85	4 17	3 90	3 75	3 90	3 90	3 90	3 92	4·08	3 85	3 80	3 61	3 37	?		2 899	3 78
3 75	3 90	4 00	4 00	3 90	4 00	3 87	3 90	3 82	3 82	3 73	3 61	3 43	3 33		2 875	3 76
3 95	4 11	4 03	4 05	4 29	4 22	4 12	4 17	4 17	4 11	3 87	3 87	3 66	3 61		3 077	4 02
4 29	4 41	4 44	4 17	4 17	4 32	4 22	4 29	4 11	4 00	3 85	3 70	3 61	3 49		3 09[illegible]	4 06
3 95	3 92	4 20	4 17	4 32	4 14	3 90	4 00	4 17	4 00	3 77	3 77	3 70	3 61	Assumed zero in computing Discharge	3 029	3 98
3 75	3 75	3 85	3 92	3 90	3 97	4 00	4 17	4 05	3 97	3 66	3 41	3 33	2 91		2 881	3 79
3 81	3 90	4 14	4 14	3 90	3 92	4 03	4 22	3 75	3 70	3 70	3 49	3 55	?		2 873	3 78
3 77	4·05	4 05	4 17	4 05	4 00	4 03	3 97	3 87	3 87	3 80	3 66	3 49	?		2 910	3 82
3 73	3 97	4 08	3 97	4 14	4 21	3 97	4 00	3 75	3 82	3 7	3 59	3 53	?		2 891	3 80
3 82	3 77	3 82	3 70	3 61	4 08	3 90	3 95	4 00	3 87	3 68	3 61	3 45	3 55		2 83[illegible]	3 73
3 61	3 80	3 73	3 80	3 66	3 80	3 97	3 85	3 87	3 85	3 55	3 64	3 35	3 49		2 811	3 70
4 17	4 22	4 32	4 38	4 70	4 17	4 14	4 22	4·03	4 24	3 87	3 75	3 53	3 41		3 041	4 02
4 17	4 26	4·05	4 08	4 03	4 14	4 24	4 26	4 11	3 90	3 85	3 70	3 57	3 37		3,004	3 97
68	·77	71	68	71	64	64	54	49	47	58	67	49	? 70	?	284	37
3 92	3 98	4·03	4 02	4 00	4 04	4 03	4 05	3 99	3 94	3 79	3 67	3-53	?3·43	?	2,941	3-66

MEAN VELOCITIES

Solani Right

[Instruments—1"

Serial No.	1 Date 1876 77 78	2 Depth Central H	Variation	Hyd. Mean R	Surface-Breadth b	Length of Rod l	3 Fall of Water Surface Upper 5 miles F_1	Lower 4½ miles F_2	Local Slope S	4 Wind From Direction	Velocity	To Direction	Velocity	5 Timekeeper's Initial	Mean past (Each Velocity Left of 42½	42	41½	40
Series 112	6 4 77	8 67	00	7 23	84 0	8	5 93	4 74	195	W	3	NW	5	T	Assumed zero in computing Discharge	2 83	3 30	3 61
	19 4 77	66	00	22	0	8	5 84	4 70	Not observed.	NE	4	NNE	8	P		Not observed.	3 26	3·39
	13 4 ,,	65	+ 01	21	0	8	5 80	4 60		NE	7	N	21	W			3 23	3 53
	10 4 ,,	64	00	20	0	8	5 81	4 74		W	9	W	7	P			3 19	3 13
	,, ,,	64	00	20	0	8	,,	,,		W	7	S	17	W			3 08	3 28
	17 4 ,,	60	00	18	0	8	5 80	4 70		W	7	WSW	6	P			3 00	3 37
	,, ,,	60	− 01	18	0	8	,,	,,		WSW	6	W	4	W			3 11	3 41
	,, ,,	59	00	17	1	8	5 81	4 09		W	4	W	7	P			3 17	3 26
	,, ,,	59	00	17	1	8	,,	,,		W	7	W	5	W			3 16	3 30
	11 4 ,,	58	− 01	17	1	8	5 82	4 78		NE	5	SE		P			3 19	3 43
	,, ,,	57	− 01	16	1	8	5 83	4 77		SE	9	W	10	W			3·08	3 45
	,, ,,	56	− 01	16	1	8	5 84	4 76		W	10	NE	7	P			3 19	3 28
	,, ,,	55	00	15	1	8	5 85	4 75		NE	7	S		W			3 21	3 59
	12 4 ,,	55	00	15	1	8	5 85	4 75		N	8	N	4	P			3 00	3 47
	10 7 76	53	00	13	1	8	5 82	4 73		S	12	SW	14	H		3 21	3 45	3 82
	13 7 ,,	50	00	11	1	8	5 90	4 60	220	..	0	NNE	8	H		3 01	3 37	3 77
	,, ,,	50	00	11	1	8	,,	,,	,,	NNE	8	NE	5	W		3 13	3 47	3 75
	20 3 '78	41	− 12	06	2	8	5 00	4 41	19?	WSW	5	WSW	7	R		3 13	3 19	3 53
	δ Range,	26	..	17	2	0	19	39	?	..	..	..	.	..	?	? 38	47	09
	v Means of 18	8 58	..	7 16	84 1	8	5 85	4 71	?	NW b W 1				.	?	?3 08	3 20	3 47
113	21·3 '78	8 16	00	6 88	84 3	7½	5 84	4 36	225	.	0	W	7	T	?0	2 83	3 33	3 33
Series 114.	1 4 76	8 05	00	6 80	84 4	7	5 76	4 35	?	W	6	W	5	H	Assumed zero in computing Discharge.	2 83	2 91	3 24
	,, ,,	·05	00	80	4	7			?	W	5	W	6	W		2 80	2 94	3 30
	4 4 ,,	00	00	77	4	7	5 80	4 30	205	..	0	SSW	6	W		2 73	2 90	3 26
	,, ,,	00	00	77	4	7	,,	,,	,,	SSW	6	SW	7	H		2 63	2 99	3 21
	,, ,,	00	00	77	4	7	,,	,,	,,	SW	7	SW	1	W		2 68	2 97	3 41
	5-3-77	·00	00	77	4	7½	5 90	4 30	?	W	7	S	6	P		?	3·13	3 34
	6 3 ,,	7 98	00	75	4	7½	5 9?	4 28	195	W b E	7	.	0	W		?	2 90	3 45
	7 3 ,,	98	00	75	4	7½	5 92	4 28	?	W	7	S	1	P		?	3 23	3 33
	12 3 78	98	00	75	4	7	5 87	4 18	195	..	0	SE	8	T		2·89	3 16	3 26
	23-3 ,,	97	00	75	4	7½	5 98	4 17	Not observed	S	8	S	15	W		?	2 94	3 31
	6-4-76	98	+ ·05	75	4	7	5 82	4 28		..	0	SW	5	W		2 59	3 05	3 33
	,, ,,	98	− 05	75	4	7		,,		SW	5	SW		H		2 73	2 90	3 28
	,, ,,	95	00	73	4	7	5 85	4 25			0	..	6	H		2 54	2·87	3 37
	3-4 ,,	95	00	73	4	7	5 85	4 25		W b S	4	..	6	H		2 63	3 06	3 28
	5-4 ,,	95	00	73	4	7	5 85	4 25		..	0	..	6	H		2 03	3·05	3 35
	,, ,,	95	00	73	4	7	,,	,,		..	0	..	6	W		2 61	2 ?0	3 41
	,, ,,	95	00	73	4	7	,,	,,		..	0		6	H		2 42	3 01	3 14
	,, ,,	95	00	73	4	7	,,	,,		..	0	SW	11	W		2 73	2 99	3 23
	26 6 ,,	95	− 06	73	4	7	5 85	4 35	210	.	0	S	5	W		2 80	3 53	3 68
	,, ,,	89	− 07	·63	4	7	5 91	4 23	•	S	5	N	15	H		2 88	3 19	3 53
	δ Range,	16	..	11	0	½	23	18	?015	..	.	..		.	?	?·61	·66	54
	v Means of 20	7 93	..	6 75	84·4	7	5 85	4 28	?201	SSW 3				..	?	?2 73	3 05	3 33

AQUEDUCT.

in Tube-Rods]

6															7	8
VELOCITIES each vertical. is the mean of three observations]															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY.
centre						Centre	Right of centre									
37½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	42½	D	V
3 80	4 17	4 11	3 80	4 17	4 05	4 11	4 3[illegible]	4 00	3 90	3 75	3 57	3 57	3 45	Assumed zero in computing Discharge.	2,892	3 92
3 64	3 64	3 75	3 75	3 70	3 80	3 77	3 85	3 80	3 59	3 68	3 55	3 56	3 31		2 684	3 65
3 64	3 92	3 85	3 70	3 87	3 80	3 87	4 00	3 66	3 90	3 75	3 77	3 30	3 45		2,722	3 79
3 59	3 70	3 70	3 73	3 70	4 00	3 95	3 75	3 73	3 77	3 51	3 57	3 33	3 30		2 692	3 66
3 64	3 61	3 92	3 77	3 70	3 80	3 90	3 80	3 73	3 68	3 80	3 57	3 39	3 26		2,689	3 66
3 58	3 85	3 77	3 85	3 45	3 92	3 97	3 70	3 95	3 82	3 75	3 66	3 45	3 37		2,608	3 69
3 75	3 85	3 87	3 82	3 75	4 08	3 90	4 00	3 77	3 68	3 80	3 66	3 49	3 43		2,718	3 72
3 55	3 70	4 00	3 80	3 45	3 85	4 08	3 66	3 70	3 73	3 77	3 64	3 43	3 39		2 674	3 66
3 68	3 73	3 77	3 77	3 81	3 82	4 00	3 85	3 85	3·77	3 59	3 70	3 32	3 30		2,722	3 73
3 70	3 59	3 73	3 73	3 82	4 11	4 05	3 95	3 90	3 75	3 73	3 51	3 33	3 09		2,742	3 76
3 57	3 93	3 87	3 70	3 80	3 57	3 59	3 87	3 85	4 00	3 66	3 64	3 53	3 49		2,661	3 66
3 51	3 64	3 82	3 49	4 00	3 70	3 92	3 87	3 90	3 76	3 83	3 66	3 49	3 47		2,726	3 75
3 64	3 53	3 82	3 70	3 77	3 87	3 75	3 73	3 68	3 66	3 73	3 57	3 59	3 45		2 651	3 65
3 53	3 77										3 68	3 37	3 30		2,636	3 63
4 23	4 11										3 64	3 47	?		2,798	3·86
3 87	4 03										3 57	3 41	?		2 713	3 75
4 11	4 11										3 58	3 66	?		2 709	3·87
3 80	3 95										3 80	3 57	3 61		2,677	3 74
·71	·64	41	·65	72	54	63	69	·34	·43	·44	29	·36	? 35	?	256	·29
3·72	3 82	3·86	3·79	3 80	3·83	3·92	3 91	3·94	3 77	3·74	3 63	3 47	?3 40	?	2,710	3 73
3 80	3 75	3 61	3 90	3 93	3 85	4 29	4 05	3·90	3 75	3 66	3 70	3 45	3 45	?0	2,66[illegible]	3 85
3 39	3 64	3 49	3 66													3 51
3 39	3 51	3 80	3 66													3 51
3 55	3 59	3 64	3 59													3 60
3 43	3 55	3 66	3 73													3 63
3 51	3 49	3 70	3 57													3 55
3 37	3 61	3 53	3 68													3 55
3 66	3 59	3 64	3 73										[illegible]		[illegible]	3 66
3 70	3 75	3 68	3 49										3 23	Assumed zero in computing D.	2,483	3 66
3 80	3 75	3 85	3 80										3 33		2,465	3 63
3 47	3 57	3 64	3 55										3 17		2,486	3 67
3 55	3 57	3 75	3 75										3 06		2,381	3 51
3 47	3 49	3 66	3 68										3 00		2,374	3 50
3 70	3 59	3 68	3 66										2 91		2,453	3 63
3 41	3 28	3 59	3 64										2 99		2 343	3 47
3 64	3 55	3 80	3 61										2 96		2 418	3 58
3 49	3 64	3 64	3 75										3 11		2 416	3 58
3 70	3 70	3 70	3 80										3 08		2,410	3 57
3 45	3 68	3 75	3 75	3 82	3 95	3 80	3 83	3 80	3 49	3 55	3 51	3 33	3 16		2,461	3 64
3 97	4 00	3 95	3 87	3 75	4 00	3 95	3 85	3 92	3 80	3 66	3 70	3 33	3 17		2,544	3 76
3 77	3 92	4 03	3 85	3 70	3 66	3 92	4 00	3 80	3 68	3 61	3 68	3 53	3 16		2,487	3·71
·60	72	54	38	·53	43	50	45	·40	44	·31	·42	·36	·42	?	19[illegible]	·29
3·57	3 62	3 71	3 69	3 69	3 71	3 76	3 79	3 74	3 62	3 58	3 44	3 30	3 10	?	2,43[illegible]	3 60

MEAN VELOCITIES

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[*Instruments—1"*

	1	2					3			4				5				
		DEPTH.					FALL of Water-Surface			WIND					MEAN past [Each Velocity Left of			
										From		To						
Serial No	Date, 1876 7 78	Central	Variation	Hyd Mean	Surface Breadth	Length of Rod	Upper 5 miles	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity	Timekeeper's Initial				
		H		R	b	l	F_1	F_2	S						42½	41¾	41½	40
115	9 10 '77	7 80	00	6 63	81 4	7	6 10	4 10	1 98	.	0	..	0	G	?0	?	3 21	3 85
Series 116.	27-3 '77	7 56	+ 02	6 46	84 5	7	5 84	4 01	?	N	5	NW	4	W	Zero in computing D	?	2 75	3 31
	9 3 '78	55	00	45	5	7	5 90	3 95	203	W	[illegible]	..	0	T		2 73	3 23	3 33
	7 3 "	50	00	41	5	7	5 90	3 90	213	W	[illegible]	S	7	T		2 94	3 19	3 33
	8 3 "	50	00	41	5	7	5 95	3 90	205	NW	6	NW	[illegible]	R		3 19	3 23	3 33
	11 3	50	00	41	5	7	5 95	3 90	205	..	0	.	0	R		3 19	3 03	3 37
	21 2 '77	45	+ 06	38	5	7	6 05	3 95	?	W	9	W	9	P		?	3 05	3 31
	8 11 "	40	00	·34	5	7	6 05	2 90	210	W	[illegible]	W	13	G		2 94	3 00	3 41
δ Range		16	..	12	0	0	21	1·11	?010	..	..	..	..		?	? 46	48	10
v Means of 7		7 49		6 41	84 5	7	5 95	3 79	?207	NW b W 1					?	?3 00	3 07	3 34
117	5 11 '77	7 10	00	6 15	85 0	6½	6 00	2 60	20	E	4	N	0	G	?0	?	3 13	3 31
	21 7 '78	08	+ 05	13	0	6	6 12	3 78	230	..	0	..	0	H	?0	2 93	3·00	3·61
δ Range,		02	..	02	0	5	12	1 18	021	..	.	..	.	..	?	?	13	30
v Means of 2		7·09	..	6 14	85 0	6 3	6 06	3 19	220	NE b N 2				..	?	?2 93	3 07	3 46
Series 118.	19 7·'76	6 86	− 02	5 97	85 0	6	5 99	3 56	230	..	0	NNE	7	H	Assumed zero in computing Discharge.	3 14	3 23	3 59
	14 1 '78	68	00	83	0	6	6 02	3 08	224	..	0	..	0	P		2 86	3 03	3 37
	" "	69	+ 01	84	0	6	6 01	3 09	224	..	0	SW	4	G		2 89	2 99	3 31
	" "	69	00	84	0	8	"	"	"	S	8	S	6	P		2 88	3 06	3 39
	10-1- "	68	00	83	0	6	5 97	3 08	?	NW	8	S	6	G		2 63	3 09	3 39
	" "	68	00	83	0	6	"	"	?	S	8	S		P		2 52	2 73	3 16
	" "	68	00	83	0	6	"	"	?	S	9	S	10	G		2 91	2 96	3 47
	12 1· "	67	00	83	0	6	5·93	3·07	215	E	7	W	6	P		3 00	3 11	3 39
	"	67	− 03	83	0	6	"	"	"	S	4	W	6	G		2 88	3 21	3 43
	20 7· 6	65	00	81	·0	6	6 03	3 45	230	..	0	N		W		2·94	3 11	3 43
	11 12 '7·	65	00	81	·0	6	5 95	3 25	Not observed	W	5	W		G		2·94	3 13	3 37
	" "	65	00	81	0	6	"	"		W	3	W	6	P		3 03	3 11	3 1[illegible]
	"	65	00	81	0	6	"	"		W	5	SW	10	G		2 97	3 13	3 33
	17-1 '78	63	00	80	0	6	6 02	3 33		S	9	S	10	P		2 86	3 03	3 09
	" "	63	00	80	·0	6	"	"		S	10	S	15	G		2 70	3 0	3·39
	" "	63	00	80	0	6	"	"		S	13	S	6	P		2 80	2 93	3 19
δ Range,		23	..	17	0	0	12	49	?01.	..	..	..	.	.	?	62	·50	55
v Means of 16,		6 67	..	5 83	85 0	6	5 99	3 21	?22	S 4				.	?	2 87	3·06	3 31
Series 119.	25 7 '76	6·30	·00	5 55	85·0	6	6·40	3·10	210	..	0	..	0	H	Zero in computing D.	?	3·17	3 41
	16-10 '77	24	+ 02	50	·0	5½	6 36	2·09	184	..	0	..	0	P		3 [illegible]0	3 35	3 77
	24 7 '7[illegible]	13	+ 03	41	0	5	6 47	2 93	·70	NE	10	..	0	W		3 06	3 19	3 73
	9 7 '78	13	+ 25	41	0	5½	6 57	2 93	31	..	0	..	0	R		3 19	3 31	3 [illegible]
	15-10- "	13	− 05	41	0	5½	6 42	1 93	188	..	0	..	0	R		3 30	3 17	3·82
	10-7- "	11	+ 15	40	·0	5½	6·79	2 41	27	N	6	W	11	P		2·83	2 90	3 70
	26 7·'7[illegible]	·00	00	32	0	5	6·30	2 60	2·0[illegible]	..	0	..	0	H		3·01	3 31	3 70
δ Range,		·30	..	23	0	5	·67	1 12	13	..	..	..	.		?	? 42	47	52
v Means of 7		6·15	..	5·43	85·0	5·4	6 53	2·61	24	NNE 1				..	?	?3·2[illegible]	3·23	3·63

AQUEDUCT.

tin *Tube-Rods*]

6															7	8
VELOCITIES each vertical is the mean of three observations).															CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY
centre.						Centre	Right of centre									
37½	35	32½	30	20	10		10	20	30	32½	35	27½	39½	41½	D	V
4·00	4·00	4·05	4·11	4·08	4·11	3·95	3·90	3·90	3·95	3·75	3·57	3·61	3·41	?0	2,561	3·86
3·66	3·64	3·68	3·80	3·23	3·70	3·68	3·64	3·73	3·59	3·61	3·37	3·13	3·16	Zero in computing D	2,126	3·49
3·61	3·57	3·57	3·53	3·66	3·61	4·00	3·75	3·90	3·75	3·66	3·45	3·26	2·97		2,349	3·66
3·70	3·57	3·49	3·66	3·66	3·75	3·57	3·80	3·66	3·70	3·49	3·37	3·33	3·16		2,250	3·53
3·45	3·70	3·66	3·57	3·80	3·66	3·80	3·70	3·70	3·66	3·41	3·49	3·33	3·26		2,236	3·60
3·49	3·61	3·66	3·53	3·66	3·95	3·90	3·95	3·61	3·70	3·45	3·53	3·45	3·23		2,300	3·62
3·49	3·68	3·66	3·70	3·85	3·95	3·85	3·75	3·82	3·49	3·47	3·39	3·41	3·03		2,320	3·57
3·61	3·61	3·85	3·70	3·73	3·82	3·75	3·97	3·68	3·47	3·49	3·53	3·33	3·19		2,269	3·61
25	13	36	27	62	34	·43	33	·29	28	·25	·16	32	29	?	223	·17
3·57	3·63	3·63	3·64	3·66	3·78	3·79	3·79	3·73	3·62	3·51	3·45	3·32	3·14	?	2,275	3·59
3·59	3·70	3·80	3·77	3·80	3·53	3·80	3·95	3·61	3·41	3·47	3·41	3·47	2·97	?0	2,172	3·60
3·80	3·85	4·05	4·08	3·91	3·95	3·82	3·95	3·80	3·61	3·59	3·39	3·39	3·16	?0	2,245	3·73
·21	·15	25	31	·12	42	02	00	19	20	12	02	08	19	?	73	·13
3·70	3·78	3·93	3·93	3·86	3·74	3·81	3·95	3·71	3·51	3·53	3·40	3·43	3·07	?	2,208	3·67
										3·68	3·45	3·45	3·00	Assumed zero in computing Discharge.	2,15	3·70
										3·53	3·43	3·24	2·97		2,00	3·53
										3·37	3·31	3·26	3·08		2,090	3·55
										3·51	3·43	3·16	2·96		2,021	3·55
										3·47	3·41	3·23	2·84		2,04	3·60
										3·35	3·33	3·06	2·91		2,01	3·54
										3·51	3·47	3·45	3·17		2,01	3·56
										3·51	3·49	3·26	2·97		2,044	3·61
										3·49	3·43	3·31	2·99		2,057	3·63
										3·53	3·33	3·17	?		2,02	3·59
										3·66	3·45	3·24	3·09		2,030	3·59
										3·59	3·59	3·23	2·99		2,077	3·67
										3·55	3·49	3·23	3·03		2,031	3·59
3·64	3·47	3·61	3·77	3·68	3·85	3·75	3·85	3·57	3·53	3·43	3·47	3·31	3·01		2,00	3·57
3·43	3·53	3·66	3·73	3·66	3·75	3·82	3·77	3·68	3·73	3·39	3·39	3·21	2·99		2,010	3·58
3·41	3·55	3·59	3·61	3·77	3·65	3·82	3·57	3·73	3·57	3·57	3·43	3·49	2·83		2,024	3·59
44	50	42	52	21	·57	40	38	36	24	33	28	43	? 34	?	155	17
3·61	3·63	3·66	3·70	3·73	3·75	3·76	3·74	3·70	3·62	3·51	3·43	3·27	?2·99	?	2,03	3·59
3·66	3·82	3·77	3·80	3·66	3·77	3·77	3·57	3·66	3·45	3·49	3·19	3·19	2·91	Zero in computing D	1,908	3·56
3·92	3·97	4·17	3·95	4·00	4·17	3·82	3·90	3·61	3·61	3·45	3·43	3·23	3·21		1,974	3·72
3·95	3·97	4·03	4·03	3·97	4·00	4·00	3·97	3·62	3·68	3·73	3·33	3·24	3·16		1,977	3·79
3·95	4·05	4·11	4·29	4·29	4·29	4·00	4·22	4·22	4·22	4·00	3·95	3·90	3·55		2,107	4·04
3·85	3·95	4·03	3·90	4·05	4·11	4·03	3·77	3·68	3·59	3·49	3·35	3·23	3·09		1,96	3·77
3·55	3·53	3·45	3·75	3·75	3·80	3·87	3·63	3·75	3·68	3·55	3·53	3·41	3·23		1,68	3·63
3·66	3·73	3·87	3·87	3·92	3·8	3·75	3·75	3·73	3·55	3·49	3·31	3·28	2·91		1,804	3·65
·40	·52	72	54	63	57	23	65	61	79	55	·76	71	64	?	243	·43
3·79	3·80	3·92	3·94	3·95	4·00	3·89	3·84	3·78	3·68	3·60	3·44	3·35	3·15	?	1,951	3·74

MEAN VELOCITIES

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[*Instruments—Nos* 120 *to* 126 1" *tin Tube Rods*

1		2					3			4				5				
		DEPTH					FALL of Water-Surface			WIND					MEAN past [Each Velocity Left of			
										From		To						
Series No	Date 1876 77 78	Central	Variation	Hyd Mean	Surface-Breadth	Length of Rod	Upper 5 m	Lower 4½ miles	Local Slope	Direction	Velocity	Direction	Velocity	Took ...				
		H		R	b	l	F	F_2	S						42½	4½	4½	40
Series 120	13-10-7	93	+ 05	6	8 0	5	5 77	1 93	Not observed	SSW	4	SSW	4	P	Not in many ?D	?	2 69	3
		86	+ 08	1	0	5½	5·84	1 86		S	4	SSW	4	G		?	2 73	2 86
		85	00	0	0	5	5·60	1 85		S	5	S	10	P		?	2 65	2 94
	"	84	+ 03	19	0	5½	5·81	1 81		W	1	S		G		?	2 5	2 9
	23-1		00	1	0	5	5·9	?		E	4	E	4	G		2 59	2 2	3 13
	1 10	7	00	14	0	5	5 93	? 47		NE	4	W	5	G		?	2 63	2 9
	"	6	0	13	·0	5½	5 91	? 46		W	5	S	0	P		?	2 9	2 9
	" "	6	05	0	0	5	5 97	2 33		E	5	WSW	1	G		?	2 86	3 6
	" "	6	+ 05	·0	0	5				WSW	10	WSW	5	P		?	2 90	3 2
δ Range		30		24	0	5	20	9							?	?	27	35
v Means of v		8		5 14	8 0	3	89	?0		SSW 3					?	?? 09	?	3·0?
121	14 10	5 63	00	5 0	8 0	5	6·1	1 3	180		0		0	R	?o	2 8	2 99	3 28
	27	58	05	4 9	0	5	6 3	3 05	300		0	S	0	W	?o	2 90	2 99	3 45
δ Range		05		01	0	0	15	1 55	120						?	12	00	17
v Means		5·61		5 00	8 0	5	6	? 31	?1	S ?					?	? 84	? 99	3 3
Series 122	22 12	4 7	00	4 17	8·0	4	5 63	1	Not observed	E	8	W		P	Assumed ... during Discharge	2 50	2 48	2 68
		57	00	17	0	4				W	5	S		G		2 24	2 42	2 59
	"	7	00	1	0	4				S	9	S	9	P		2 38	2 42	2 6
	"		00	1	·0	4				S	9	S	6	G		2 40	2 30	2 67
		5	00	17	·0	4		"		S	8	W		P		2 40	2 40	2 8
	"		00	1	0	4	5 68			W		S		G		2 33	2 4	2 56
	24 12 "	40	+ 03	10	·0	4	5 61	1 9	19		0	S		P		2 4	2 33	2 6
	"	4	+ 05	07	0	4	5 6	1	19	S b W			0	G		2 24	2 34	2 55
	"	42	00	0	0	4	5 68	1	?	S	6	S b W		P		2 3	2 33	2 62
	19-12	40	00	03	0	4	5 6	1 0	?1	SW	4	S	10	G		2 11	2 35	2 48
	23 8 8	43	+ 05	0	0	4	6·37	? ?3	?4	N	7	E	6	P		2 2	2 5	2 8
	? "	35	+ 05	3 99	·0	3½	6·0	1 9	?6		0	N		R		2 8	2	3 03
	6	33	00	97	0	4	6 87	71 73	3	S	6	SE	4	H		?	2 86	3 05
δ Range		24		20	·0	5	1 26	753	7135						?	? 39	56	57
v Means		4 48		4 10	8·0	4 0	5 8	71 81	??3	S b E					?	?? 33	? 46	? 0
123	1 10-7	3·6	00	3 40	8 0	3	4 0	0	?		0		0	G	?o	?	6	62
124	31	3 4	− 1	3 6	8·0	3	6 61	1 9	19		0	N		W	?o	?	2 20	2 32
125	10	0	− 01	10	8·0	1½	7 6	4	?0	S	1	S		P	?o	1 23	1 36	45
126	11	19	− 24	1	8	1½	5·93	?	?	S	6	S	6	R	?o	1 08	1 6	1 12
127	11	0	0	·6	84	½	7 40	?	113	N	11	S	8	P	?o	4	5	55

Aqueduct

No 127 1" wood Rods]

6															7	8
Velocities each vertical is the mean of three observations]															Cubic Discharge in cub feet per sec	Mean Velocity
centre.						Centre	Right of centre.									
3 ½	35	3 ½	30	20	10		10	20	30	3 ½	35	3 ½	39½	42½	D	V
3 17	3 30	3 16	3 00	3 17	3 23	3 28	3 33	3 35	2 93	3 11	3 01	2 83	2 80	Zero in computing D	1 57	3 13
3 06	3·08	3 13	3 13	3 05	3 26	3 35	3 23	3 3	3 13	3 14	3 14	2 86	2 80		1 50	3 12
3 26	3 19	3 08	3 03	3 26	3 01	3 35	3 9	3 41	3 30	3 11	3 06	3 05	2 82		1 582	3 18
3 03	3 19	3 26	3 19	3 37	3 23	3 26	3 37	3 37	3 30	3 30	3·06	2 73	2 73		1,583	3 19
3 4	3 61	3 64	3 3	3 57	3 70	3 66	3 61	3 57	3 24	3 37	3 33	3 11	2 88		1 69	3 46
3 30	3 53	3 33	3 37	3 30	3 09	3 37	3 37	3 4	3 41	3 33	3 13	3 33	2 97		1 60	3 27
3·06	3 30	3 37	3 08	3 17	3 19	3 33	3 59	3 28	3 19	3 26	3 14	2 99	3 01		1 55	3 8
3 26	3 45	3 4	3 49	3 45	3 45	3 33	3 53	3 37	3 26	3 16	3 13	2 80	2 88		1 560	3 27
3 30	3 41	3 39	3 2	3 35	3 28	3 24	3 39	3·43	3 26	3 23	3 14	3 00	3·03		1 550	3 24
44	53	56	73	52	69	42	42	34	48	26	32	60	30	?	143	34
3 21	3 34	3 31	3 25	3 30	3 27	3 3	3 40	3·38	3 22	3 22	3 13	2 97	2 88	?	1 584	3 23
3·47	3 57	3 53	3 53	3 70	3 66	3 39	3 55	3 45	3 45	3 33	3 16	3 06	2·83	?o	1 69	3 40
3 4	3 53	3 55	3 53	3 64	3 55	3 75	3 57	3 49	3 28	3 31	3 09	2 94	2 82	?o	1 639	3 46
06	04	02	00	06	11	36	04	04	17	02	07	12	01	?	12	06
3 44	3·55	3 54	3 53	3·67	3·61	3 57	3 57	3·47	3 37	3 32	3 13	3 00	2 83	?	1 63	3 43
2 69	2 8	2 75	2·82	2 88	2 93	2 90	2 6	2 86	2 79	2 8	2 65	2 58	2 31	Assumed zero in computing Discharge	1 076	2 77
2 72	2 88	2 97	3 16	2 88	2 88	2 86	3·03	2 91	2 91	2 86	2 75	2 60	2 26		1 092	2 81
2 78	2 83	2 91	2 94	3 06	2 99	3·06	2 87	2 96	2·94	2 79	2 80	2 53	2 30		1 120	2 88
2 75	2 83	2 86	2 8	2 97	3 08	2 91	3·05	2 91	2 86	2 90	2 73	2 62	2 34		1 099	2 83
2 84	2 79	2 90	2·40	2 99	2 87	3 01	2 94	2 91	2 6	2 80	2 69	2 60	2 43		1 104	2·84
							3 06	2 94	2 80	2 65	2 91	2 69	2 27		1 102	2 84
							2 74	2 86	2 60	2 61	2 53	2 35	2 17		1 02	2 69
							2 36	2 84	2 53	2 73	2 0	2 62	2 10		1 030	2 72
							2 80	2 8	2 61	3 6	2 60	2 46	2 22		1 031	2 74
							2 83	2 97	3 00	2 87	2 84	2 67	2 45		1 024	2 74
							3 39	3 39	3 16	3 14	2·93	2 82	2 62		1 21	3 24
							3 53	3 45	3 28	3 13	3 06	2 96	2 60		1 23	3 35
3 23	3 4	3 16	3 13	3 39	3 53	3 37	3 55	3 41	3 57	3 41	3 30	3 16	3 14		1 214	3 30
70	92	90	81	·83	90	75	·81	·61	1 04	80	77	·81	1 04	?	213	66
2·83	2 92	2 96	2 96	2 99	3 02	3 0	3 03	3 02	2 91	2 88	2 81	2 67	2 40	?	1 106	2 90
70	65	69	68	67	73	72	8	78	76	75	72	73	63	?o	218 9	71
2 44	2 6	2 53	2 46	2 4	2 53	2 60	2 65	2 52	2 44	2 31	2 25	2 1	2 03	?o	722 ?	2 43
1 43	1 49	1 58	1 46	1 46	1 55	1 65	1 90	1 88	1 84	1 76	1 71	1 60	1 43	?o	? 6	1 61
1 21	1 17	1 19	1 21	1 21	1 16	2 20	1 35	1 46	1 42	1 38	1 24	1 1	99	?o	?02 8	1 24
55	58	53	53	54	56	57	66	[illegible]	78	·67	65	49	44	?o	[illegible]	·60

MEAN VELOCITIES

SOLÁNÍ RIGHT AQUEDUCT,

[*Instrument*—1"

Serial No	1	2					3			4				5	MEAN past (Each Velocity			
	Date 1876-77 78	DEPTH.			Surface-Breadth	Length of Rod	FALL of Water-Surface.			WIND				Timekeeper's Initial	Left of			
		Central	Variation	Hyd Mean			Upper 5 miles	Lower 4½ miles	Local Slope	From		To						
		H		R	b	l	F_1	F_2	s	Direction	Velocity	Direction	Velocity		42¼	41¾	41¼	40
131	27 10-'77	4 60	00	4 20	85 0	4	3 60	10	024		0	SW	0	G	?o	?	84	1 01
	" "	60	00	·0	0	4	"	"	0·0	SW	6	NE	6	F	?o	?	1 00	1 03
	δ Range	00	.	00	0	0	00	00	00	..	..	..	.	..	?	?	16	02
	v Means of 2	4 60	..	4 20	85 0	4	3 60	10	025	SW 3					?	?	92	1 02
132	1 9 '76	3 98	− 01	3 67	85 0	3	6 17	98	480	..	0	..	0	H	?o	?	4·05	3 91
	" "	93	− 05	·63	·0	3	"	93	46	.	0		0	W	?o	?	3 55	4 00
	δ Range,	05	..	04	0	0	00	05	01	.	..	..	.		?	?	·50	03
	v Means of 2,	3 96	.	3·65	85 0	3	6 17	96	47	Calm					?	?	3 80	3 99
133	18-10 '77	3 60	00	3 35	85·0	3	4 35	·00	?	NE	4	Y	4	P	?o	?	61	65
134.	31 8-'76	3 58	+ 06	3 33	85 0	3	6 22	86	?	SSW	10	SW		W	?o	?	2 08	2 27
135	21 9-'78	3 18	+ 05	2 99	85 0	2	6 22	68	253	..	0	..	0	F	?o	1 96	2·16	2 21
136	21 9 '78	3 12	+ 03	2 94	85 0	2½	6 26	62	205	.	0	..	0	R	?o	1 88	2 27	2 27
137	31-8 '76	3·13	+ 10	2 94	85 0	3	6 17	43	200	..	0	SW	12	H	?o	?	1 90	2 11
138	31 8-'76	2 88	+ 05	2 72	85 0	2	6 52	18	145	..	0	.	0	W	?o	?	2·07	2 13
139	20-9 '76	2·71	− 02	2 57	85·0	2	5 59	21	168	NW	6	V	6	R	?o	1 44	1 61	1 81
	" "	60	00	2 47	·0	2	6 00	10	13	V	6	S	6	P	?o	1 28	1 17	1 56
	δ Range,	11		10	0	0	11	11	035	..		..	.	..	?	·16	44	45
	v Means of 2,	2·66	..	2 52	85·0	2	5 55	16	151	S 1					?	1·36	1·39	1 69

AND CUBIC DISCHARGES **TABLE XLI**

[LEFT AQUEDUCT CLOSED]

tin Tube Rods]

6															7	8
VELOCITIES each vertical is the mean of three observations].															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
centre.						Centre	Right of centre.									
37½	35	31½	30	21	10		10	20	30	32½	35	37½	39½	42½	D	V
1·03 1 15 10 1·08	1 14 1·05 06 1 11	1 13 1 14 01 1 14	1 05 1 12 0 1 03	1 17 1 21 04 1 19	1 19 1 23 04 1 21	1 29 1 37 08 1 33	1 36 1 43 07 1 40	1 32 1 38 06 1 35	1 35 1 33 02 1 34	1 35 1 38 03 1 37	1 32 1 32 00 1 32	1 19 1 21 02 1 20	1 12 1 14 02 1 13	?0 ?0 ? ?	472 2 491 , 19 5 481 9	1 21 1 26 05 1 24
4 21 3 8 35 4 05	4 32 4 20 12 4 26	4 65 4 41 24 4 53	4 76 4 51 25 4 64	4 91 5 00 08 4 96	5 22 5 21 00 5 22	5 17 5 13 04 5·15	5 50 5 10 37 5 39	5 36 5 26 10 5 31	5·00 4 84 16 4 92	5 00 5 00 00 5 00	4 84 4 65 19 4 75	4 35 4 20 15 4 28	3 80 3 77 03 3·79	?0 ?0 ? ?	1 648 1,597 51 1 623	4 87 4 78 09 4 83
71	65	63	65	65	64	71	79	77	75	77	74	73	65	70	212·0	·69
2 24	2 70	2 83	2 95	3 19	3 49	3 70	3 59	3 51	3 51	3 39	3 11	2 79	2 78	?0	979 0	3 22
2 55	2·6	2 82	3·01	3 30	3 49	3 5	3 35	3 47	3 43	3 19	3 14	3·00	2 60	70	865 6	3 20
2 16	2 43	2 53	2 65	2·91	3 33	3 19	3 00	3 06	3 06	3 13	3 06	2 97	2 41	?0	740 ?	2 79
2 05	2 20	2 26	2 26	2 31	2 56	2 69	2 91	2 94	2 90	2 68	2 65	2 28	2 15	?0	667 ?	2 51
2 11	2 35	2 31	2 34	2 4	2·61	2 ,6	2 94	2 83	2 74	2 ,0	2 43	2 26	1 95	?0	620 7	2 54
1 69 1 66 03 1 68	1 72 1 52 20 1·62	1 88 1 65 23 1 77	1 94 1 74 20 1 84	2 14 2 07 07 2 11	2 33 2 39 06 2 36	2 56 2 37 19 2 47	2 56 2 43 13 2 50	2 61 2 33 28 2 47	2 50 2 35 15 2·43	2 52 2 26 26 2·39	2 40 2 26 14 2 33	2 29 2 18 11 2·24	2 04 1 90 14 1 97	?0 ?0 ? ?	525 6 467·0 58 6 496·3	2 28 2 11 17 2 20

MEAN VELOCITIES

Soláni Embankment

[*Instrument*—1"

Serial No.	1 Date 1876 77 78 79	2 Depth. Above Datum. A	Variation.	Central H	Soláni Aqueduct Gauge	Hyd Mean. R	Surface Breadth b	3 Fall of Water-Surface Upper 4 miles F₁	½ mile below Site F	Lower 4½ miles F₂	Local Slope. S	4 Wind From Direction	Velocity	To Direction.	Velocity.	5 Timekeeper's Initial	Left Steps Immersed. Top	r	m	Last
Se[illegible]											230	E	7	..	0	A	46	2 61	3 09	3 2[illegible]
											22[illegible]	S	5	E	7	P	1 [illegible]8	2 68	2 79	3 41
											223	E b S	8	E	12	P	1 74	2 58	2 91	3 28
											226	E	4	E b S	6	A	1 84	2 74	2 94	3 33
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	226	S	3	W	10	A	1 67	2 61	2 91	3 31
δ	Range,	16	..	16	23	07	1 2	09	10	20	007	..	..	..	.		1 38	16	30	18
ν	Means of 5,	9 94	..	10 97	9·67	9 34	170 1	4 70	1 25	5 40	227	ESE 4					1 50	2 64	2 03	3 31
Series 152.	20 5 '78	10 03	− 07	11 20	9 98	9 23	171 0	4 70	1 22	5 63	213	W	8		0	G	59	2 48	3 00	3 14
	21 12 '76	9 98	− 01	16	10 00	·19	·0	4 80	1 15	5 95	?	E	5	SE	5	W	1 75	2 86	3 13	3 31
	22 12 ,,	98	00	16	·00	·19	·0	4·60	1 15	5 95	20[illegible]	E	5	W	6	P	1·94	2 86	3 13	3 19
	,, ,,	98	00	·16	·00	[illegible]	[illegible]					W	8	W	10	[illegible]	[illegible]	2 8[illegible]	[illegible]6	3 3[illegible]
	15 12 ,,	97	·00	15	00															
	19 12 ,,	97	− 01	·15	0[illegible]															
	16 12 ,,	96	+ 02	14	05															
	18 12 ,,	9[illegible]	00	13	00															
	20 12 ,,	9[illegible]	+ 01	13	00															
	[illegible]3 12 ,,	89	+ 03	07	9 80															
	,, ,,	91	+ 02	09	80															
	14 12 ,,	·87	+ 02	0[illegible]	9[illegible]															
	26 12 ,,	85	+ 01	03	84															
	,, ,,	8[illegible]	00	03	85															
	29 12 ,,	8[illegible]	+ 03	00	80															
	9-12 ,,	77	00	10 9[illegible]	8[illegible]															
	12 12 ,,	77	00	95	8[illegible]															
δ	Range,	26	..	25	25	15	2 3	·13	20	10	?024	..	..	..	.	.	1 48	40	65	85
ν	Means of 17	9 91	..	11 09	9 93	9 17	170·3	4 79	1 1[illegible]	5 94	?200[illegible]	S b E 3					1 67	2 68	3·03	3 20
Series 153.	6 1-'77	9 71										E	9	SE	0	W	1 64	2 73	3 30	2 83
	8-12 '76	57										..	0	S	8	P	1 28	2 37	2 84	3 03
	[illegible] 5-'76	[illegible]0	−									W	7	W	9	G	1 24	2 31	2 75	3 11
	12 4 ,,	4[illegible]										E	8	E	6	G	1 16	2 22	2 69	2 88
	27-5- ,,	4[illegible]	−									V	7	V	9	P	99	2 18	2 51	2 93
	1[illegible]-4 '7[illegible]	4[illegible]	+									W	9	W	2[illegible]	P	85	2 20	2 51	3 91
δ	Range,	[illegible]	..	43	·27	·21	[illegible]	21	19	72	?062	.	.		.		79	55	79	38
ν	Means of 6,	[illegible]		[illegible]	9 45	8 96	168·[illegible]	4 7[illegible]	1 [illegible]1	5 16	222	SW b W 2					1 19	2 34	2 77	2 [illegible]

AND CUBIC DISCHARGES. TABLE XLII.

MAIN SITE

in Tube Rods]

6 Mean Velocities past each vertical [Each Velocity is the mean of three observations].																	7 Cubic Discharge in cub feet per sec	8 Mean Velocity
of centre.						Centre	Right of centre						Steps immersed					
74½	70	65	60	40	20		10	40	60	65	70	74½	Last ¼	m ½	g ¾	Top	D	V
																		4·09
																		4 11
																		3 93
																		4 04
3 09	3 59	3 61	3 45	3 85	4 00	4 17	4 41	4 22	3 92	3 39	3 33	3 00	3 01	2 83	2 26	94	6,940	3 91
22	34	31	35	46	41	68	49	46	24	41	40	16	18	48	26	48	424	20
3 13	3 34	3 83	3 63	4·05	4 15	4 28	4 23	4 30	3 80	3 59	3 53	3 10	3 09	3 04	2 39	1 03	7,170	4·02
																		3 91
																		3 83
																		3 93
																		3 88
																		3 82
																		3 88
																		3 84
																		3 93
																		3 80
																		3 88
																		3 80
																		3 84
																		3 74
																		3 86
																		3 67
																		3 82
																		3 91
45	40	49	58	49	85	65	74	62	57	66	62	33	37	51	42	1 04	545	20
2 97	3 45	3 62	3 55	3 93	3·97	4·01	3 95	4 04	3 74	3 55	3·38	2 93	3 16	3 06	2 43	1 15	6,725	3 85
																		3 84
																		3 70
																		3 67
																		3 67
																		3 72
																		3 64
42	30	37	48	36	35	23	59	47	23	47	30	35	26	72	31	59	436	20
2 83	3 29	3·50	3 66	3 75	3 99	3 88	3 82	3 93	3 61	3 47	3 29	2 84	3 11	2·99	2 59	1 71	6,276	3·71

MEAN VELOCITIES

SOLANI EMBANKMENT

[*Instrument*—1"

1		2						3				4				5				
		DEPTH						FALL of Water-Surface.				WIND					Left			
												From		To			[illegible] immersed.			
Serial No	Date, 18 6 77 8	Above Datum A	Variation	Central H	Solani Aqueduct Gauge	Hyd Mean R	Surface-Breadth s	Upper 4 miles, F₁	1 mile below site F₂	Lower 4½ miles F₃	Local Slope S	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Top	d	m	Last
Series 154	4 12 77	9 19										S	4	S	9	G	1 65	2 14	2 75	2 88
	10 4 78	11	+									V	4	.	0	G	1 67	2·08	2 50	3 03
	7 12 „	·05	+									..	0	..	0	P	1·62	2 18	3 31	3 30
	6 12 77	·02	+									WNW	7	W	17	P	1 49	2 31	2 ,4	2 74
	7 12 „	·01	+ 01	10	·58	64	[illegible]	4·72	1 30	4 78	220	S	0	W	7	G	1 34	2 22	2 ,8	3 09
δ Range,		18	.	·26	12	18	1 2	·14	13	12	2035	..	..	..	.		33	23	75	56
v Means of 5,		9·08		10·23	8 94	8 68	167 0	4 71	1 39	4 83	2220	SW b W 4					1 5[illegible]	2 10	2 83	3·01
Series 155	2[illegible]											V	4	W	6	P	83	1 78	2 17	2 48
	[illegible]											..	0	..	0	B	1 44	2 60	3 14	3 24
												W	6	..	0	P	1 14	2 05	2 ,3	2 54
												W	6	W	6	G	67	1·62	2 ,8	2 59
												W	20	W	19	P	59	1 9	2 40	2 ,5
	[illegible]	[illegible]	− [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SW	4	WSW	7	G	4,	1 ,8	1·95	2 33
δ Range,		29	..	34	22	24	0	40	14	30	049	..	.	.	.		97	98	1 19	·91
v Means of 6,		6 74	.	9 87	8 65	8 42	166 [illegible]	4 72	1 26	4 65	21,	W 5					86	1·04	2 46	2 66
156	20 1 7,	8 44	+ ·05	9 69	7 55	8 23	16[illegible] 2	3 94	2·06	3 9[illegible]	2[illegible]	ENE	11	..	0	P	1 53	1·9,	2 16	2 35
	„	47	− 02	·6[illegible]	58	2[illegible]	[illegible]	3 91		3·98	,	.	0	E	7	W	1 43	1 6	2 ,6	2 53
	0-1	41	00	·5[illegible]	·50	21	2	3 67	2 08	3·9[illegible]	?	NNE	8	N	4	P	1 51	2 04	2 03	2 24
	„	42	+ 01	60	50	22	[illegible]	3·66	2 09		?	N	4	SW	6	W	1 46	2 00	2 07	2 33
δ Range,		06	.	06	08	·04	·0	08	03	08	?						10	37	33	29
v Means of 4,		8·43		9 62	7 55	8 23	16[illegible] 2	3 90	2 0	3 93	?	NE 3					1 4[illegible]	1 92	2 14	2 30
Series 157	21 3 8	8 24										SE	3	V	4	G	1 30	1 ,9	2 12	2 29
	20-1 7	1[illegible]										W	8	W	[illegible]	P	1 27	1·90	2 36	2 48
	3-3-	13										S	4	.	(	W	2 42	1·91	2 30	2 45
	[illegible]-3-	10										N	4	N	4	P	1 13	2·06	2 26	2 68
	[illegible] 3- .	·08	+									NW	10	.	(	W	1 28	1 54	2·03	2·60
	[illegible] „	·07										NW	4	SW	4	P	1·0[illegible]	1 87	2 15	2 ,0
	12 3- ,8	·0[illegible]	00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SE	6	SE	[illegible]	P	·96	1 69	1 83	2 30
δ Range,		19	..	19	23	16	0	07	14	28	20[illegible]5	.		..			46	52	53	41
v Means of 7		8·12	..	9 20	8·02	8·01	164 (	4 63	1 27	4 27	221[illegible]	W 1					1 20	1·82	2 1[illegible]	2 50
158	13-9- ,6	7 9[illegible]	+ 28	9 1[illegible]	7 9[illegible]	7 88	164·0	4 73	1 17	4 3[illegible]	21[illegible]	.	0	W	17	H	?	1·95	2 40	2 74
	11 [illegible]- „	8[illegible]	− 03	·03	,0	80	0	4 85	1·32	4 10	21		0	E	4	H	·86	2 14	2 34	2 44
δ Range,		10	..	10	25	08	0	15	15	25	00(						?	19	06	30
v Means of 2,		7 90		9·08	7 83	7 84	164·0	4 81	1 2[illegible]	4 23	21[illegible]	W 3					? 86	2 0[illegible]	2·3[illegible]	2 [illegible]9

AND CUBIC DISCHARGES **TABLE XLIII.**

MAIN SITE

in Tube-Rods]

6																	7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations																	CUBIC DISCHARGE in cub. feet per sec	MEAN VELOCITY
of centre						Centre.	Right of centre						Steps Immersed.					
74½	70	65	60	40	20		20	40	60	65	70	74½	Last	m	q	Top	D	V
																		3 74
																		3 68
																		3 81
																		3 64
																		3 65
65	61	30	25	27	30	39	50	30	20	45	52	24	27	13	42	1 24	425	18
2 72	3 2	3 4	3 41	3·87	3·8	3 8	4 04	3 9	3 54	3 45	3 29	2 84	3 03	2 85	2 3	1 55	5,974	3 70
																2 08	5 400	3 48
																1 59	6 350	4 05
																1 62	5 617	3 58
																1 52	5 379	3 45
																1 37	5 365	3 45
																96	5 212	3 42
79	81	75	97	92	74	79	81	88	45	49	64	50	43	60	79	1 12	1,141	63
2 73	3 07	3 33	3 32	3·74	3 74	3 84	3 74	3 61	3 46	3 49	3 19	2 71	2·84	2 66	2 22	1 59	5,564	3 6
																91	5 003	3 32
																91	4 930	3 26
																71	4 861	3 23
2 12	2 79	2·94	3 01	3 49	3 35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		71	4,73	3 15
·20	25	28	12	25	12	52	·42	36	40	17	26	20	29	17	09	·26	268	17
2 23	2 76	2 96	3 09	3·36	3 32	3 37	3 34	3 42	3 32	3 0	2 86	2 37	2 52	2 22	1 67	84	4 88	3·24
																		3 44
																		3 32
																		3 26
																		3 3
																		3 18
																		3 3
																		3 35
29	27	21	29	49	54	64	41	67	24	31	56	40	28	59	49	54	470	26
2 36	2 81	3 13	3·06	3·46	3·42	3 50	3 50	3 43	3 23	3 17	2·94	2 52	2 73	2 41	2·08	1 52	4,832	3 3
2 56	2 83	3 39	3·06	3·03	4 14	3 77	3 64	3 80	3 45	3 00	2 78	2 54	2 33	2 51	2 13	1 36	4 89	3 45
2 61	2 97	2 96	3 37	3 33	3 47	3 80	3 61	3 68	3 00	3 06	2 73	2 39	2 54	2 35	2 37	1 19	4,828	3 42
05	14	43	31	30	33	03	03	12	45	06	05	15	18	18	18	17	65	01
2 59	2 90	3 16	3 22	3 18	3 81	3 79	3 63	3 74	3 23	3·03	2 76	2 47	2 42	2 42	2·22	1 29	4 860	3 43

MEAN VELOCITIES

SOLANI EMBANKMENT

[*Instrument*—1"

Serial No	1	2						3				4				5				
	Date, 1876-77 78	DEPTH						FALL of Water-Surface.				WIND				Timekeeper's Initial	Left			
		Above Datum	Variation	Central	Solani Aqueduct Gauge	Hyd Mean	Surface-Breadth	Upper 4 miles	1 mile below Site	Lower 4½ miles	Local Slope	From		To			S eps immersed.			
		h		H		R	b	F_1	F_2	F_4	S	Direction	Velocity	Direction	Velocity		T p	q	m	Last
Series 159	9 9 76	7·65	− 04										0	S	14	W	1 59	2 29	2 47	2 54
	9 3 78	63	− 02										0	..	(	P	1 35	1 86	2 01	2 33
	7 3 ,,	61	00										6	W		G	1 19	1 63	2 11	2 12
	8 3 ,,	·61	− 01										10	V	7	P	1 31	1 55	2 28	2 18
	11 3 ,,	60	− 01										0		0	G	1 39	1 80	2 08	2 31
	2 3 77	60	00										9	W	14	W	1 49	2 08	2 39	2 41
	12 9 76	59	− 08										0	NE	17	W	1 58	2 11	2 34	2 41
	8 9 ,,	61	00										0	ENE	c	B	1 49	1 95	?	2 46
	27 2 77	40	00										7	W b S	2	P	1 22	1 92	2 37	2 28
δ Range,		22	..	22	20	·13	1 2	1 07	19	·15	?010	..	..	..	.		40	74	? 46	42
v Means of 9		7 59	..	8 77	7 51	7 64	162 6	4 80	1 2	3 9	?214	WSW 3					1 40	1 91	?1·08	2 34
Series 160	25 5 76	7 20	+ 09	8 38	7·03	7 36	161 "	4 53	1 34	3 63	218	..	0	V	4	G	68	1 45	1 92	2 14
	22 2 ,,	·07	− 01	2	90	·26	"	4 71	1 31	3 50	215	N b E	4	S	7	P	?	1 1,	1 6,	2 03
	,, ,,	07	− 01	2	90	26	7	.	,,	.	213	S	7	W	6	G	?	1 25	1 57	1 83
	. ,,	10	+ 06	28	96	28		4 68	1 31	3 56	?08	W	6	W	15	P	?	1 23	1 85	2 08
	6 2 ,	6 97	00	14	87	21	160 6	4 71	1 27	3 47	210	W	8	W b S	14	G	1 21	1 67	1 83	2 12
	8 . ,,	93	− 02	10	81	18	5	4 6	1 29	3 41	214	N	7	N	4	G	1 32	1 66	2 10	2 02
δ Range,		27	..	27	22	18	1 2	18	07	22	010	.	.	..	.		? 64	50	53	31
v Means of 6,		7·06	.	8 23	6 91	7 26	161 .	4 67	1 39	3 59	214	W 4					?1 07	1 41	1 82	2 01
Series 161.												S	9	WNW	8	G	1 05	1 46	1·81	1 93
												.	0	S	4	G	1 13	1 53	1·94	2·07
												S	4	.	(	P	1 12	1 53	1 ,6	2 07
	,,										1	E	4	S	6	G	1 21	1 54	1 72	1 91
	,,	·84	+ 02	·01	7	15	[illegible]	4 69	1 26		?	S	5	N	4	P	1 07	1 55	1 82	1·97
	24 1 ,	·84	− 03	·01	75	15	[illegible]	4 69	1 26	3 4	?	E	4	SE	6	G	1·06	1 44	1 ,0	1 69
	,, ,,	83	+ 01	·00	75	14	3	4 70	1 2	,,	?	SS	5	E b S	5	P	1·04	1 44	1 72	1 84
	18 2 ,,	83	00	·00	70	14	[illegible]	4 6	1 30	3 40	21	S b S	10	E b S	4	P	1·04	1 63	1 97	1 95
	22 1 ,	82	− 02	7 99	7	14	[illegible]	4 71	1 24	3 4	?	S	8	E	(	G	1 09	1 49	1 75	1 ,0
	,, ,	82	+ 01	99	75	14	[illegible]				?	E	5	S		P	1·06	1 46	1 ,6	1 79
	14 2 ,,	70	00	87	60	·03	[illegible]	4 65	1 7	2 30	21	S	8	S	18	P	82	1 45	1 76	1·83
δ Range,		15	..	15	13	17	0	08	08	55	?000	.					32	19	27	38
v Means of 11		6·82		7 99	6 72	7 12	1 9 .	4 68	1 27	3 39	?21	SSL 4					1 06	50	1 79	1·89

Main Site

in Tube-Rods]

6																	7	6
Mean Velocities past each vertical. (Each Velocity is the mean of three observations).																	Cubic Discharge in cub feet per sec	Mean Velocity.
of centre						Centre	Right of centre.						S ... immersed					
74½	70	65	60	40	20		20	40	60	65	70	74½	Last	m	g	Top	D	V
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 40
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 21
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 23
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 26
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 36
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 38
2 14	[illegible]	3 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 05
47	18	27	75	67	47	55	45	43	22	31	22	51	35	51	55	21 14	590	35
2 8[illegible]	2 84	3 07	3 [illegible]2	3·80	3 40	3 42	3 44	3 45	3 17	3 09	2 89	2 41	2 44	2 20	1 78	21 24	4,459	3 20
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 48	4 162	3 19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	85	4,093	3 19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83	4 086	3 18
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	86	4,15[illegible]	3 22
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	70	4,154	3 28
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	60	4,072	3 2[illegible]
18	30	31	34	16	57	33	30	32	36	35	23	36	51	43	35	88	91	10
2 14	2 62	2 99	2 99	3·45	3 49	3 30	3 30	3 37	3 13	2 93	2 73	2 30	2 24	1 84	1·58	87	4,120	3 22
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 42	3 834	3·0[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 51	3 909	3 14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 38	3 958	3 18
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 4[illegible]	3,808	3 11
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 31	3 66[illegible]	3 10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 40	3 930	3 16
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 34	3,917	3 14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 42	3,811	3 06
1 90	2 52	2 75	3 03	3 23	3 30	3 13	3 33	3 17	3 13	3 03	2 84	2 36	2 14	1 90	1 09	1 35	3,831	3·05
1 83	2 45	2 79	2 83	3 16	3 [illegible]0	3 26	3 19	3 24	3 01	2 97	2 60	2 22	2 [illegible]	1 [illegible]9	1 71	1 [illegible]	3 82[illegible]	3 08
2 01	2 52	2 82	2 80	3 21	3 06	3 30	3 49	3·47	2 96	2 65	2 49	2 15	2 20	1·89	1 53	1 2[illegible]	3,80[illegible]	3 11
34	33	28	40	41	38	38	·41	34	25	35	41	25	32	42	27	24	155	11
1 9[illegible]	2 34	2 76	2 94	3 24	3 21	3 28	3 31	3·27	3·03	2 75	2 67	2 19	2 12	1 97	1 71	1 3	3,865	3 11

MEAN VELOCITIES

Solání Embankment

[*Instrument*—1″

* Series 163 only 3 steps immersed. † Series 164, 165,

Serial No	1	2						3				4				5				
		Depth						Fall of Water-Surface				Wind					Left			
												From		To			S ps Immersed			
	Date 1876 77 78	Above Datum. A·	Variation	Central H	Solání Aqueduct Gauge	Hyd. Mean. R	Surface-Breadth. b	Upper 4 miles F₁	1 mile below Site. F·	Lower 4½ miles F₂	Local Slope S	Direction	Velocity.	Direction	Velocity	Timekeeper's Initial	Top	[illegible]	[illegible]	Last
Ser.												..	0	..	0	W	1 29	1 92	2 05	2 63
												S	9	S	9	G	60	1 30	1 66	1 96
												..	0	..	0	F	1 19	2 21	2 36	2 63
												..	0	ENE	7	F	?	2 40	2 38	2 73
	" "	26	− 02	·44	33	68	·3	5 27	"	3 13	160	ENE	7	NE	4	W	?	2 29	2 61	2 90
δ Range,		26	..	26	22	22	0	·33	17	·30	123	..	..	..	..	..	? 69	1 10	95	04
v Means of 6,		6 39	..	7 56	6 49	6 78	159 3	5 10	1·14	3 16	221	SE b E 2				.	?1·03	2 02	2·21	2 57
Series 163.	21-10-'76	5·66	− 01	6 84	5 00	6 25	157 0	5·07	1 23	2 70	158	..	0	..	0	H	73		1 60	1·75
	" "	·62	− 02	80	·56	22	·0	5 11	"	2 66	180	..	0	S	6	W	63	see *	1 67	1 81
	19-10- "	5.	00	73	·49	16	0	5 13	1 23	2 59	200	W	7	..	0	H	?		1 80	1 95
	" "	·56	+ 01	74	50	17	0	5 17	"	2 60	19.	W	12	SW	4	W	?		1 80	1 80
	20-10- "	55	− 01	73	50	16	·0	5·08	1 22	2 60	16.	..	0	..	0	H	?		1 57	1 ,0
	" "	·51	− 01	·69	·46	13	·0	5 12	"	2 56	160	..	0	..	0	W	?		1 59	1 87
δ Range,		15	..	13	14	12	0	10	01	14	050	..	..	..	..	..	? 10	..	23	25
v Means of 6,		5·58	..	6 76	5 52	6 18	157·0	5 11	1 23	2 62	171	WSW 2					? 68	..	1 67	1 82
164.	11-10-'77	5 24	+·75	6 42	14 69	3 99	154 7	5 29	1 72	2 49	?	W	7	N	4	F	60	see †	see †	1 58
Series 165.	10-10-'77	5·01	− 05	6 19	4·92	5 78	154 7	4 42	1 76	2 32	?	E b S	5	SW	7	G	1 01			1 42
	10-10-'76	4·97	+ 02	15	5 20	75	7	4 91	0·94	1 30	186	..	0	NW	?	W	87	see †	see †	1 13
	" "	5·00	+ ·03	18	20	78	·7	4 88	0·97	"	170	NW	6	..	0	F	83			1 65
	" "	·00	00	18	20	78	7	4 63	"	"	"	..	0	W	6	W	94			1 58
	11-10- "	4 90	− 03	·08	30	65	7	4 63	0·77	1 20	140	..	0	E	14	F	·75			1·32
	" "	86	00	·04	30	65	7	4 67	0 75	"	15.	..	0	..	0	W	75			1 44
δ Range,		·15	..	13	·38	13	·0	·49	·53	1 12	?040	..	..	..	.	.	26	..	..	33
v Means of 6,		4·96	..	6 14	5 19	5 74	154 7	4 69	91	1 47	?16.	N b E 1				.	·86	..	..	1·46
166.	10-10-'77	4 33	− 07	5 71	4 30	5 44	132 .	4 70	1·20	1 90	?	WSW	9	WSW	6	G	see ‡	see ‡	see ‡	·93
	9-10-'76	46	− 02	·64	75	39	2	4·87	0·89	1 3.	15.	..	0	N	1.	F				1 14
	11-10-'77	26	·00	44	20	21	.	4 77	1·22	2 00	?	E	4	E	1.	G				·85
δ Range,		27	..	27	35	·23	0	·17	33	65	?	..	..	..	.	.	..	..	..	29
v Means of 3,		4 41	..	5·60	4 45	3 33	132·0	4 4.	1 10	1 73	?	ESE 3					..	..	..	·97

AND CUBIC DISCHARGES

TABLE XLV.

MAIN SITE

tin Tube Rods]

only 3 steps immersed.   ‡ Series 155 only 3 step immersed.

6																	7	8
MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations).																	CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
of centre.						Centre	Right of centre						Steps immersed					
74½	70	65	60	40	20		20	40	60	65	70	74½	Last	m	e	Top	D	V
																		3 36
																		3 15
																		3 49
																		3 41
																		3 52
1 25	98	64	48	52	39	45	54	30	88	39	42	52	98	35	62	·40	342	·37
2 70	3·24	3 29	3 26	3 40	3 44	3 40	3 45	3 03	3 23	3 07	2 86	2·35	2 56	2 00	1 75	99	3,973	3 39
															see *	85	3 342	3 15
																77	3,280	3 12
																83	3,18	3 06
																82	3,127	2 99
																76	3,160	3 04
2·08	2 44	2 63	2·84	3 08	3 14	3 11	3 16	3 16	2 58	2 37	2 21	1 92	1 05	1 44		78	3,055	2 95
15	23	33	53	73	45	42	43	25	36	22	46	32	·33	39	.	09	287	20
2·0	2 52	2 82	2 87	3 20	3·31	3 34	3 12	3 23	2 68	2 34	2 20	1 74	1 62	1 41	..	·80	3,194	3 05
1·68	1 96	2 30	2 14	2 61	2 82	2 87	3 31	2 99	2 94	2 61	2 55	2 01	1 90	see †	see †	1 49	2,715	2 7
														see ←	see ←	98	2,748	2 87
																97	2,492	2 62
																84	2,480	2 60
																87	2,358	4 60
																·83	2,278	2 42
																89	2,228	2 38
25	27	37	46	38	58	21	44	·47	80	70	54	28	·39	..	.	15	520	49
1 60	2 06	2 19	2·35	2·66	2 63	2 64	2 55	2 66	2 45	1 99	1 96	1·47	1 30	..	..	·90	2,432	2 56
1 51	1 66	1 97	2 10	2 42	2 56	2 56	2 61	2 63	2 26	2 01	1 80	1 56	1·03	++	++	++	2,117	2 39
2 49	1 88	2 05	2 20	2 54	2 59	2 59	2 33	2 50	2 42	1 95	1 80	1 2	·96	see	see	see	2,010	2 40
1 42	1 89	2 17	2 04	2 19	2 59	2 48	2 50	2 65	2 19	2 05	1 71	1 40	·90				1,968	2 33
09	23	20	16	35	03	11	28	15	23	10	09	33	13	..	..	..	149	0
1 47	1 81	2·06	2 11	2 38	2 58	2 54	2 48	2 59	2 29	2·00	1 17	1 40	96	..	..	..	2,061	2 37

MEAN VELOCITIES

Solání Embankment

[*Instrument*—1*

N. B.—Series 167 168 — Lowest Step slightly immersed on Right Bank throughout.

	1	2						3				4				5		
		Depth						Fall of Water-Surface.				Wind						
												From		To				Left
Serial No	Date, 1876-77	Above Datum	Variation	Central	Solání Aqueduct Gauge	Hyd Mean	Surface Breadth	Upper 4 miles	1 mile below Site.	Lower 4½ miles	Local Slope.	Direction	Velocity	Direction	Velocity	Timekeeper's Initial		
		A		H		R	ϕ	F_1	F_2	F_3	S						75	731
Series 167.	15-2-77	4·03	− 12	3 27	4 35	5·06	152 3	4 24	0·91	1 15	?	SW	11	SW	21	W	Zero in computing D	1 19
	7 10-'76	·03	− 02	·6	50	·05	3	4 65	0·75	1 30	205	..	0	NE	5	P		1 32
	" "	07	·00	25	19	·05	3	4·66	"	4 20	"	NE	5	E	21	W		1 35
	10-2-'77	·00	00	18	·07	·02	151 2	4 83	1 10	1 07	?	S b E	5	SW	6	W		1 33
	" "	·00	·00	16	·07	·02	2	"	·	"	?	SW	8	SW	10	P		1 31
	14-2 "	3·98	00	16	10	·00	2	4 70	1·05	1 70	185	..	0	S	10	W		1 14
	" "	98	00	16	10	·00	2	"	"	"	"	S	10	SSW	12	P		1 19
	19-2- "	99	− 02	17	35	·01	2	4 59	0·81	2 15	?	E	4	SW	7	P		1 17
	" "	96	− ·04	14	32	98	2	4·62	"	2 12	?	SW	7	S	7	W		1 40
	" "	92	− 04	10	23	95	2	4 66	"	2·03	?	S	7	W	11	P		1 32
	δ Range.	·17	..	·17	13	·11	1 2	59	33	1 00	?	..	..	..	.		?	·26
	r Means of 10	4·01	..	5 19	4 26	5·01	151 5	4·63	91	1 74	?	SSW 5					?	1 24
168.	15 10-'77	3 93	− 23	5 16	4 50	5·00	151 2	4 45	65	60	?	ENE	9	E	17	G	?o	1 33
Series 169	17 2-'77	3·79	− 03	4 97	4 00	4 87	150 0	4 39	0 96	0·90	?	SW	6	S	6	P	Zero in computing D.	1 14
	" "	78	00	·96	3 99	86	·0	4 40	0·95	0 89	?	S	6	SW	17	W		1 10
	8-2- "	75	·00	·93	75	83	·0	4 78	1·37	4 75	?	NE	8	S	15	P		1 37
	6-10-'76	·76	·00	·94	4·00	·84	·0	4·67	0 93	1·00	200	..	0	..	0	P		1 25
	" "	75	− 02	93	·00	83	·0	4·68	0·92	"	"	..	0	NNE	7	W		1 29
	" "	73	− 01	·91	·00	·81	·0	4 70	0 90	"	"	NNE	7	NE	5	P		1 20
	" "	72	− ·02	·90	·00	·81	·0	1·66	0·89	"	"	NE	5	..	0	W		1 25
	5-10- "	72	− 01	90	3 40	·81	·0	4 71	1·45	0·40	200	..	0	..	0	W		1 27
	" "	·71	− ·01	89	10	·80	·0	1 72	4·48	"	"	..	0	NE	10	H		1 19
	" "	70	− ·02	85	40	79	·0	1 73	4 47	"	"	NE	10	ENE	18	W		1 30
	δ Range.	09	..	09	60	05	0	39	60	4 35	?	..	.	..	.	.	?	23
	r Means of 10	3·71	..	4·92	3 70	4·83	150·0	4·61	4 42	·87	?200	E 3					?	1 24
170	15-10-'77	3·64	− ·06	4 52	4·25	4 75	150·0	3·7	·50	·35	?	SE b S	5	W	4	G	?o	·90
	25-9-'76	·63	− ·06	81	·10	72	·0	4 40	·70	·60	165	..	0	..	0	H	?o	1·07
	δ Range.	01	..	01	15	·01	0	·61	·14	25	?	..	..	..	.		?	17
	r Means of 2.	3·64	..	1 82	4 15	4 73	150·0	4 40	·63	·45	?165	SE b S 1					?	99

TABLE XLVI

AND CUBIC DISCHARGES

Main Site

tin Tube Rods]

on Left Bank on y in three top Sets of Series 167   Series 169 1 0   No Sie u Immersed.

6																7	8
Mean Velocities past each vertical Each Ve oc y is the mean of hree observati ns].																Cub c Discharge in cub. feet per sec	Mean Velocity
of centre.						Centre	Right of centre										
2½	70	65	60	40	20		20	40	60	65	70	21	73½	5	Las step	D	V
1 31	1 66	1·92	1 94	2 40	2 38	2 20	2 14	2 3	2 06	1 70	1 45	1 30	1 13	Not observed	40	1 70	2 1
1 42	1 61	1 64	1 82	2 31	2 33	2 05	2 10	2 34	1 78	1 62	1 44	1 36	1 18		?	1 680	2 0
1 3	1 8	1 56	1 83	2 26	2 27	2·1	2 03	2 27	2 03	1 59	1 46	1 26	1 12		?	1 681	2 06
1 47	1 60	1 93	1 92	2 36	2 25	2 30	2 35	2 23	2 28	1 74	1 58	1 52	1 30		44	1 740	2 17
1 54	1 69	1 93	1 84	2 09	2 40	2 44	2 26	2 29	2 22	1 84	1 61	1 49	1 22		43	1 730	2 16
1 37	1 6	1 88	1 97	2 41	2 34	2 24	2 31	2 35	2 14	1 98	1 7	1 59	1 24		?	1 70	2 10
1 30	1 59	1·85	1 75	2 64	2 33	2 15	2 20	2 29	2 27	1 75	1 68	1 37	1 23		?	1 758	2 19
1 41	1 57	1 96	1 99	2 30	2 27	2 15	2 14	2 38	2 28	1 79	1 61	1 53	1 24		34	1 72	2 15
1 41	1 0	1 94	2·03	2 33	2 32	2 19	2 24	2 24	2 19	1 71	1 68	1 46	1 41		45	1 711	2 14
1 40	1 66	1 89	2 16	2 3	2 42	1 95	2 39	2 27	2 08	1 76	1 76	1 42	1 4		?	1 66	2 0
24	21	40	41	55	17	49	36	15	50	39	32	33	30		? 11	94	14
1 40	1·66	1 80	1·93	2·34	2 33	2 18	2 2	30	2 13	1 7	1 00	1 43	1 2		? 41	1 72	2 14
1 36	1 40	1 6	1 51	1 74	1 8	1 72	1 55	1 84	1 72	1 53	1 29	1 09	1 09	?0	?0	1 300	1·69
1 0	1 39	1 69	1 79	2·0	1 96	1 83	2·03	2 00	1 90	1 65	1 59	1 28	1 17	Zero in computing D.	Not immersed	1 444	1 87
1 26	1 39	1 47	1 74	1 80	1·94	1 79	1 89	2·03	1 66	1 63	1 40	1 11	1 13			1,374	1 78
1 46	1 50	1·92	1 80	2 34	2 42	2 19	2 16	2 29	2 00	1 84	1 65	1 29	1 14			1 63	2 13
1 36	1 50	1 55	1 73	2 27	2 10	1 82	1·81	2 08	1 73	1 67	1 37	1 36	1 15			1 469	1 91
1 33	1 56	1 75	1·86	2 24	2·08	1 78	1 90	2 07	1 55	1 38	1 37	1 23	1 10			1 449	1 89
1 26	1 51	1 51	1 76	2·05	1·96	1 85	1 71	2 05	1 78	1 46	1 32	2 16	1 10			1 411	1·85
1 30	1 49	1 58	1 67	2 21	1 97	1·67	1 86	2 12	1 89	1 50	1 30	22	1 13			1 424	1 87
1 31	1 37	1 62	1 69	2 13	2 09	1 79	1 76	2·09	1 62	1 5	1 45	1 32	1 12			1 420	1·86
1 29	1 55	1 57	1 56	10	98	1 85	1 89	2 0	1 76	1 53	1 23	1 22	1 21			1 410	1·85
1 40	1 44	1 62	1 65	2 14	1 95	1 83	1 86	1 96	1 78	1 50	1 33	1 26	1 07			1 404	1 85
20	19	45	30	54	48	52	45	33	45	46	42	20	14	?		261	35
1·33	1·47	1 63	1 73	2 13	2 0	1·84	1·89	07	1 77	1·57	1 40	1 6	1 13	?		1 444	1·89
1·06	1 10	1 32	1 15	1 62	1 55	1 50	1 40	1 57	1 52	1 16	1·06	99	92	?0	No mme sed.	1 090	1 46
1 19	1 28	1 23	1 40	1 85	1 80	1 35	1 52	1 71	1 51	1 31	1 10	1·01	94	?0		1 15	1 34
13	18	09	25	23	25	15	12	14	01	13	04	02	02	?		56	·08
1 13	1 19	1 8	1 8	1 74	1 68	1 43	1 46	1 64	1	1 24	1·08	1·00	93	?		1 14	1·0

MEAN VELOCITIES

SOLANI EMBANKMENT

[Instruments—1[illegible]

Series 171 to 175—[illegible]

Serial No	Date, 1876 77 78	DEPTH Above Datum A	Variation	Central H	[illegible] A'	Hyd Mean R	Surface-Breadth b	FALL of Water-Surface Upper F₁	[illegible] F₂	Lower F₃	Local Slope S	WIND From Direction	Velocity	To Direction	Velocity	Time[illegible]	Left [illegible]	[illegible]
1		2						3				4				5		
171	31-10-77	3·67	+·01	[illegible]	[illegible]	[illegible]	1·0[illegible]	3·60	·24	·10	[illegible]	S	4	S	17	C	[illegible]	·60
	30-10- "	·61	+·03	[illegible]	·44	·41	[illegible]	3·62	·24	·01	"	S	[illegible]	SW	1[illegible]	P	[illegible]	·55
	" "	·57	·00	[illegible]	·00	[illegible]	[illegible]	3·60	·24	·00	"	E	10	S	[illegible]	C	[illegible]	·52
	Range	·10		·10	·10	·05	[illegible]	·04	·00	·10	?	.	.	..	.		?	·05
	Means of A	3·62	.	4·50	[illegible]	4·72	1·04	3·[illegible]	·24	·0[illegible]	[illegible]	S 9					?	[illegible]
172	26-10-77	3·64	·00	4·52	[illegible]	4·72	1·00	3·33	·2[illegible]	·0[illegible]	?	SE	10	.	[illegible]	P	[illegible]	·38
	22-10- "	·51	−·05	·63	·5[illegible]	·62	[illegible]	3·42	·13	·0[illegible]	?	SW	4	SW	[illegible]10	G	[illegible]	·40
	Range	·13		·13	1·00	·11	[illegible]	·03	·13	·00	?	..	..	..	.	.	?	·02
	Means of A	3·[illegible]	.	4·70	4·5[illegible]	4·63	1·00	3·41	[illegible]	·0[illegible]	?	SbW 3					?	·3[illegible]
Series 173	[illegible] 10-73	3·43	−·01	3·33	4·[illegible]	3·5[illegible]	1·00	4·24	·41	·10	·0[illegible]	..	0	E	11	E	[illegible]	1·05
	6-10- "	·42	·03	[illegible]	[illegible]	[illegible]	[illegible]	4·21	·41	·10	·0[illegible]	..	0	SW	17	E	[illegible]	1·0[illegible]
	3-10- "	·4[illegible]	−·02	·31	[illegible]	[illegible]	[illegible]	4·31	·33	·10	·0[illegible]	E	6	E	[illegible]	P	[illegible]	1·03
	4-10- "	·44	·00	[illegible]	·20	·44	[illegible]	4·[illegible]	·41	·0[illegible]	·0[illegible]	E	8	E	1[illegible]	E	[illegible]	1·0
	[illegible] 10- "	·44	−·02	[illegible]	·20	·44	[illegible]	[illegible]	·41	·10	·05	[illegible]	0	[illegible]	[illegible]	P	[illegible]	1·06
	Range	·05	..	·03	·0[illegible]	·04	[illegible]	·10	·02	·03	·010	..	..	..	.		?	·03
	Means of A	3·47	..	3·31	4·23	3·[illegible]	1·00	4·23	·41	·09	·0[illegible]	E b S 3					?	1·06
174	20-3-7[illegible]	3·04	−·3[illegible]	4·22	3·7[illegible]	4·22	1·0[illegible]	4·[illegible]	·31	·6[illegible]	12	..	0	..	0	W	?	·9[illegible]
Series 175	4-10-7[illegible]	2·8[illegible]	+·03	4·0[illegible]	[illegible]	4·[illegible]	1·0[illegible]	[illegible]	1·18	1·40	·21	..	0	..	0	H	[illegible]	1·06
	" "	[illegible]	+·01	·08	[illegible]	[illegible]	[illegible]	5·0[illegible]	1·17	"	"	..	0	..	0	W	[illegible]	1·11
	" "	·3	[illegible]	·10	·30	·00	[illegible]	5·01	1·19	"	"	..	0	..	0	H	[illegible]	1·03
	" "	·31	−·01	·03	·30	·05	[illegible]	5·0[illegible]	1 [illegible]	"	"	..	0	.	0	W	[illegible]	1·04
	" "	·3[illegible]	−·02	·05	·30	·07	[illegible]	5·0[illegible]	1·17	"	"	SW	5	W	[illegible]	H	[illegible]	1·09
	Range	·0[illegible]	..	·03	·03	·01	[illegible]	·05	·03	·0[illegible]	·00	.	.	.	.		?	·11
	Means of A	2·3[illegible]	..	4·05	2·30	4·07	1·00	5·02	1·17	1·40	·21	W b S 2					?	1·07

TABLE XLVII

AND CUBIC DISCHARGES

MAIN SITE

tin Tube Rods]

steps immersed.

6															7	8
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]															CUBIC DISCHARGE in cubic feet per sec.	MEAN VELOCITY
of centre						Centre	Right of centre									
77½	0	65	60	40	20		20	40	60	65	70	73½	731	5	D	V
6	69	77	9	1 12	1 04	91	93	99	91	70	69	64	59	?0	704·0	93
60	63	6	·66	89	89	80	85	87	75	71	55	57	50	?0	600 7	81
54	60	70	68	99	98	81	90	92	83	62	64	55	47	?0	624	84
13	09	07	13	23	15	11	08	12	16	09	14	09	12	?	104 2	12
60	·64	74	71	1·00	97	84	·89	93	83	·68	63	59	52	?	643	86
48	51	53	55	85	74	74	0	81	65	51	50	46	45	?0	516	69
41	48	51	49	72	67	59	68	69	60	45	36	34	3	?0	400 8	62
07	03	02	06	13	07	15	02	12	05	06	14	12	14	?	65 0	07
45	50	[illegible]	52	79	71	67	69	75	63	48	43	40	38	?	483	66
1 19	1 20	1 41	1 36	1 51	1 40	1 35	1 47	1 45	1 43	1 38	1 24	1 19	1 02	?0	852 7	1 40
1 16	1 24	1 38	1 43	1 43	1 35	1 41	1 41	1 31	1 40	1 28	1 38	1 17	1 03	?0	828	1 36
1 15	1 27	1 35	1 40	1 46	1 46	1 30	1 46	1 40	1 37	1 32	1 25	1 04	96	?0	794 4	1 31
1 06	1 32	1 29	1 40	1 44	1 45	1 38	1 29	1 40	1 37	1 23	1 24	1 15	1·09	?0	820·	1 36
1 14	1 33	1 35	1 33	1 30	1 40	1 36	1 38	1 41	1 36	1 30	1 33	1 17	1 13	?0	806 1	1 34
13	13	13	10	21	11	11	18	14	07	13	14	15	17	?	58	09
1 14	1 27	1 36	1 38	1·43	1 41	1·36	1 40	1 30	1·39	1 31	1 29	1 14	1·0	?	820	1 3
1 10	1 12	1 15	1 23	1 33	1 38	1 38	1 45	1 46	1 44	1 20	1 20	1 00	91	?0	887·6	1 34
1 2	1 42	1 40	1·62	48	1 71	1·67	1 65	1 92	1 55	1 32	1 29	1 14	1 00	?0	1 15	1 82
1 19	1 44	1 52	1 45	2 09	1 94	2 0	1 80	2 02	1 56	1 30	1 18	1 10	1 11	?0	1 140	1 78
1 23	1 35	1 45	1 56	2·14	1 95	1 68	1 58	1·97	2 03	1 45	1 21	1·05	1·02	?0	1 150	1 80
1 26	1 27	1 45	1 49	1·97	1·90	1 66	1 68	1 97	1 87	1 48	1 23	1 11	1 01	?0	1 1?2	1 75
1 2	1 45	1 39	1 46	2 10	1·92	1 65	1 65	2 05	1 62	1 5	1 14	1 07	·96	?0	1 13	1 8
08	18	13	17	51	24	05	22	13	48	27	15	09	15	?	34	07
1 24	1·39	1 44	1 5	2 16	1 88	1 67	1 6	1 99	1 73	1·4	1 21	1·09	1·0	?	1 142	1 9

MEAN VELOCITIES

SOLANI EMBANKMENT

[*Instruments—Nos* 176 *to* 180. 1" *tin Tube-Rods.*

Series 176 to 181—No

Serial No.	1 Date 18 6 77 78.	2 Depth. Above Datum A	Variation	Central H	Solani Aqueduct Gauge	Hyd Mean R	Surface-Breadth b	3 Fall of Water-Surface. Upper 4 miles F₁	1 mile below Site F₂	Lower 4½ miles F₃	Local Slope S	4 Wind From Direction	Velocity.	To Direction	Velocity	5 Timekeeper's Initial	Left ·5	751
176	26-9-'78	2 83	00	3 27	3 30	3·28	150·0	5·00	70	·30	?3·	E	8	E	18	P	?o	1 30
	24 9- ,,	82	00	26	·30	2·	·0	5 06	69	30	100	..	0	NW	6	R	?o	1 25
δ	Range,	01	..	01	00	01	0	06	01	00	?163	..	..	..	.		?	05
ρ	Means of 2	2 83	..	3 27	3·30	3 28	150·0	5 03	70	·30	?240	E b N 6					?	1 28
177.	27 9-'70	2 40	−									..	0	E	10	H	?o	91
	30-9- ,,	·47	+									NE	4	E	14	W	?o	96
	29-9- ,,	·40	+									NE	4	NE	4	H	?o	81
	28-9- ,,	·33	−									E	12	E	2·	W	?o	91
δ	Range,	16	..	·16	25	15	0	12	17	32	?015	..	.	..	.		?	15
ρ	Means of 4,	2 42	..	3 00	2·51	3 64	150·0	5 07	1 08	1 15	?19	E b N 9					?	90
178	16-10-'77	2 30	00	3·48	3 20	3 33	150·0	4 63	27	10	?	..	0	SE	8	G	?o	60
	,, ,,	·33	+ 10	7·	3·	75	·0	4·0·	·37	2·	?	S b W	7	..	0	P	?o	·49
δ	Range,	25	..	25	15	22	·0	55	10	15	?	..		..	.		?	·11
ρ	Means of 2,	2 43	..	3·01	3·23	3·64	150·0	4·36	·32	18	?	SSE 4					?	·5·
179.	2 10-'70	2·00	00	3·18	2·0·	3 2·	150·0	5·18	1 12	·3·	?	W	·	..	0	H	?o	86
	,, ,,	1 9	− 02	17	·0·	21	·0	5·19	1 11	·	?	..	0	E	10	W	?o	85
	3-10- ,,	·5·	00	03	·00	11	·0	5·18	1·07	·30	180	..	0	..	0	H	?o	84
	,, ,,	·84	− 02	0·	·00	10	·0	5·19	1·01	,,	,,	..	0	NE	7	W	?o	80
δ	Range,	·16	.	10	05	10	0	01	11	03	?	..	.	..	.		?	06
ρ	Means of 4	1 92	..	3·10	2·03	3·18	150·0	5 19	1·07	·85	?180	ENE 1					?	·83
180	19-9-'78	1·69	+ 03	2 32	2·30	2 29	150·0	5·31	·56	10	150	..	0	.	0	P	?o	·74
	18-9- ,,	·64	00	2 27	·30	21	·0	5 89	21	10	14	NW	7	.	0	R	?o	·63
δ	Range	05	..	·05	00	04	0	35	35	·00	050	.	.	..	.		?	11
ρ	Means of 2,	1·67	..	2·3·	2·30	2 26	150·0	·7	·39	10	14	NW 1					?	69
181.	12 7-7	·33	+ 07	1 53		33	1·69	150·0	1 55	39	?·00	09	..	0	·	11	R	?o	30

MAIN SITE

No 181 1" *wood Rods* (< 1' *long*), *and* 1" *tin Tube Rods* (1' *and* 1½' *long*)]

steps immersed.

6															7	6
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations]															CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
of centre						Centre	Right of centre									
73½	0	65	60	40	20		20	40	60	65	70	74½	78½	75	D	V
1 36	1 51	1 55	1 57	1 74	1 74	1 67	1 81	1 70	1 65	1 49	1 51	1 28	1·09	?0	842 7	1 65
1 27	1 51	1 51	1 59	1 68	1 71	1 61	1 74	1 81	1 61	1 60	1 33	1 22	1 04	?0	837 1	1 65
09	01	03	02	06	02	06	07	11	04	11	18	06	05	?	5 6	00
1·32	1·52	1·54	1 58	1 71	1 73	1·64	1 78	1 76	1 63	1 55	1 42	1 25	1 07	?	839 4	1 65
1·01	1 22	1 25	1 38	1 73	1 68	1 41	1 47	1 69	1 39	1 20	1 11	96	81	?0	868 5	1 50
1 15	1 16	1 31	1 38	1 81	1 64	1 41	1 39	1·84	1 63	1 26	1 10	1 00	93	?0	905 0	1 58
1·04	1 20	1 32	1 36	1 83	1 63	1 45	1 48	1 58	1 51	1 11	1·05	1 04	91	?0	801 [illegible]	1 51
1 06	1 15	1 23	1 18	1 71	1 53	1 31	1 47	1 57	1 39	1 16	99	86	87	?0	788 8	1 42
14	11	10	20	12	15	14	09	27	24	14	12	18	11	?	116 4	18
1·07	1 21	1 26	1 30	1 77	1 62	1 40	1 45	1 67	1 48	1 19	1 06	97	89	?	852·9	1 50
65	66	73	75	94	88	77	89	1 02	81	67	63	·60	59	?0	470·2	86
51	63	68	·66	85	79	71	77	83	79	63	60	53	49	?0	445 [illegible]	76
14	03	05	09	09	09	05	12	19	02	04	03	·07	10	?	24 9	10
58	65	71	71	90	84	75	83	93	·80	65	62	57	54	?	457 7	81
88	1·01	1 15	1 11	1 59	1 35	1 18	1 21	1 54	1 43	1 15	·93	93	79	?0	677 1	1 34
1 01	1 05	1 06	1 15	1 47	1 32	1 50	1 20	1 50	1 45	1 13	1 05	81	75	?0	629 [illegible]	1 31
85	95	99	1 00	1 41	1 24	1 12	1 16	1 37	1 23	93	90	79	71	?0	583 7	1 11
90	96	1·00	1 05	1 43	1 31	1 11	1 18	1 38	1 11	90	90	89	72	?0	583 8	1 22
17	10	16	15	18	11	09	05	17	34	25	13	14	07	?	93 4	13
·91	1·00	1 05	1·08	1·48	1 31	1 15	1 19	1 45	1 31	1·03	94	86	75	?	626·0	1 27
74	·91	80	76	96	81	1 01	·96	1 01	1·09	1·01	85	·61	51	?0	315·0	90
76	85	74	87	88	85	95	·91	·89	1 02	96	79	52	50	?0	286 7	84
02	07	06	11	08	04	06	05	12	07	05	06	10	01	?	28 3	06
75	89	77	82	92	83	98	·94	95	1·06	·99	82	·57	51	?	300·4	87
21	11	28	25	54	43	41	49	61	29	15	13	14	16	?0	114 1	44

MEAN VELOCITIES

[*Instruments—1"*

15th Mile,

1		2									3					4				5
Serial No.	Date 1878 No. 197 in 1879.	Depth: Above Datum	Depth: Variation	Depth: Date of Soundings	Depth: Central	Depth: At Solani Aqueduct Gauge	Depth: Hyd. Mean.	Surface Breadth	Wet Border	Area	Fall of Water-Surface: Upper 2 miles.	Fall of Water-Surface: 3 miles below Site	Fall of Water-Surface: Lower 4½ miles	Local Slope: Left Bank	Local Slope: Right Bank	Wind From: Direction	Wind From: Velocity	Wind To: Direction	Wind To: Velocity	Timekeeper's Initial
		A			H		R	b	B	A	F_1	F_2	F_3	S	S					
191	29 5	15 31	+ 02	28 3	10 99	9 99	9 49	174 9	182 0	1726 8	2 28	3 63	5·54	240	?	NW	1	NE	[illegible]	R
Series 192	24-4	14 35	−												Not observed	N	3	·	0	T
	23-4	34	−													·	0	·	0	R
	10 4	33	−													·	0	·	0	T
	29 4	33	−													·	0		0	R
	30 4	30	−														0	·	0	T
	1 5	28	− 01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			0	..	0	R
δ Range,		07		..	07	10	06	0	1	12 1	05	08	10	033	?	·		·		
ψ Means of 6		14 32	..		10 00	8 98	8 64	174 9	180 0	1555 4	2 26	3 65	4 87	231	?	N 1				
193	8-4	14·03	+ 12	28 3	9·71	8 70	8 39	174 9	179 4	1505 2	2 26	3·64	4 75	228	?		0		0	R
	4-4	13 98	00	"	66	70	3[illegible]	9	3	1496·0	2 31	3 59	4 75	223	?		0		0	T
	29-3	95	00	"	63	70	32	9	2	1491 3	2 34	3·56	4 70	230	?	N	8	NW	7	R
δ Range,		08	..	..	08	00	07	0	2	13 9	08	·08	·05	007	?	·				
ψ Means of 3		13 99	..	..	9 67	8 70	8 35	174 9	179 3	1497 7	2 30	3 60	4 73	227	?	NNW 3				
194	15-4	13 72	− 03	28-3	9 40	8·40	8 12	174 9	178 8	1451 5	2 27	3 63	4 55	228	?	SW	4	..	0	R
	16-4	48	+ 01	"	16	10	7 91	9	3	1410·0	2 26	3 69	4 25	233	?	·	0	·	0	T
δ Range,		24	·	..	24	30	21	0	5	41 5	01	06	30	005	?	·		·		
ψ Means of		13 60	..	·	9 28	8 25	8 02	174 9	178 5	1430 8	2 27	3 66	4 40	231	?	SW 1				
195	25-5	12 53	+ 15	28-3	8·21	7·0[illegible]	7 13	171 3	174 7	1245 [illegible]	2 06	3 [illegible]0	3 6[illegible]	?	?	·	0	N	[illegible]	T

15th Mile,

1		2									3					4				5
	Data.	A			H		R	b	B	A	F_1	F_2	F_3	S	s	D	V	D	V	
196	16 1	15 20	− 03	16-12	9 76	9 83	8·71	186·0	191 8	16 0 3	2 25	3·60	5·43	21[illegible]	1	W	3	·	0	R
	13·1	17	+ ·01	"	[illegible]3	8[illegible]	68	18[illegible]	7	1664 [illegible]	2 21	3 64	5·4[illegible]	21[illegible]	238	·	0	N	4	R
	20·1	10	00	"	·66	80	·6[illegible]	7	·4	16[illegible]1	2 25	3 6	5·23	210	23[illegible]	·	0	N	[illegible]	R
δ Range,		10	·	·	10	·05	08	3	6	18·6	07	07	22	005	[illegible]00[illegible]	·	..	..	.	
ψ Means of		15·16	..	..	9·72	9·83	8·6[illegible]	185·9	191 6	1662 [illegible]	2 26	3·6[illegible]	5·37	[illegible]221		W 1				
197	1879 15-4	14 63	+ 10	28-4	9·72	9 3[illegible]	8·3[illegible]	184·[illegible]	169 4	1[illegible]31 [illegible]	2 1[illegible]	3 66	5 20	215	22	N	1	SW	14	R

AND CUBIC DISCHARGES

TABLE XLIX.

tin Tube Rods]

OLD SITE

6																					7	8
MEAN VELOCITIES past each vertical [Each Value y is the mean of three observations																					CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY
Left of centre										Centre	Right of centre											
Edge	Side slopes 84	82½	80	75	70	65	60	40	20		20	40	60	65	70	75	Side slopes 80	82½	84	Edge	D	V
?o	2 42	2 90	3 45	3 61	3 87	4 2-	4 29	4 05	4 55	4 55	4 29	4 29	4 22	3 95	3 85	3 33	3 00	2 83	2 8	?o	7,18	4 19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3 96
[illegible]	2·08	2 63	3·00	3 41	3·82	4 00	4 11	4 17	3 66	4 00	4 55	4 35	4 17	4 00	3 47	3 39	2 78	2 48	1 70	[illegible]	6,209	4 01
?	26	25	33	16	34	56	52	56	54	70	55	43	61	27	43	43	25	40	38	?	602	39
?	2 05	2 55	2 95	3·44	3·83	3 93	4·06	3 87	3 97	4 25	4 26	4 23	4 17	4·01	3·69	3·41	2 71	2 54	1 87	?	6,190	3 98
?o	1 56	2 48	3 19	3 37	3 75	3 85	4 05	3 95	3 80	4 00	4 21	3 95	4 48	4 00	3 75	3 33	1 65	2 50	1 58	?o	5 851	3 89
?o	1 25	2 36	2 97	3 16	3 80	3 95	4 11	3 70	4 00	4 11	4 11	4 05	3·95	4 00	3 57	3 45	2 88	1 90	1 55	?o	5 771	3 86
?o	90	2 27	2 78	3 41	3 37	3 80	3 95	3 85	3 75	4 05	4 05	4 00	4 11	4 00	3 61	3 33	2 54	2 34	1 90	?o	5 737	3 85
?	66	21	41	25	23	15	16	25	25	11	17	10	53	00	18	12	34	60	35	?	114	04
?	1 24	2 37	2·98	3 31	3 71	3 87	4 04	3 83	3 85	4·05	4 13	4 00	4 18	4 00	3 64	3 37	2 69	2 25	1 68	?	5 780	3 87
?o	1 63	2 46	2 59	3 30	4 11	3 85	3 75	4 00	4·00	4 17	4 48	4 00	4 05	3 75	3 37	3 37	3 53	2 00	2 54	?o	5 711	3 92
?o	97	1 90	2 80	3 33	3 66	3 66	3 75	3 90	3 95	4 17	3 85	4 29	4 11	3 85	3 57	3 26	2 48	2 42	1 74	?o	5 532	3 93
?	66	56	21	03	45	19	00	10	05	00	63	29	06	10	20	11	05	42	80	?	179	01
?	1 30	2 18	2·70	3 32	3 89	3 76	3 75	3 95	3 98	4 17	4 17	4 15	4 08	3 80	3 47	3 32	3 01	2 21	2 14	?	5 622	3 93
?o	?	1 44	2 24	1 97	3 26	3 45	3 53	3 45	3 61	3 66	3 57	3 66	4 00	3 61	3 30	3 00	2 36	1 76	1 69	?	4 370	3 51

NEW SITE

6																					7	8
Left of centre										Centre	Right of centre											
Edge	Side slopes 84	82½	80	75	70	65	60	40	20		20	40	60	65	70	75	Side slopes 80	82½	84	Edge	D	V
?o	2 46	2 87	3 47	3 61	4 11	4 41	4 32	4 29	4 24	4 44	4 35	4 35	4 32	4 03	3 85	3 31	3 24	2 70	2 16	?o	6 921	4 14
?o	2 50	2 78	3 70	3 70	4 17	4 69	4 35	4 22	4 35	4 22	4 41	4 29	4 55	4 05	3 70	3 39	3 23	2 75	1 95	?o	6 844	4 11
?o	2 52	2 69	3 33	3 87	4 29	4 20	4 26	4 26	4 25	4 38	4 35	4 29	4 17	4·05	3 9	3 57	3 05	2 79	2 04	?o	6,806	4 12
?	06	18	37	26	18	49	09	07	21	22	06	06	38	02	27	27	19	09	21	?	115	03
?	2·49	2 78	3·50	3 73	4 19	4·43	4·31	4 26	4 25	4·35	4·37	4·31	4·30	4·01	3·84	3 33	3·17	2·75	2·05	?	6 85[illegible]	4 12
?o	2 21	1 65	3 13	3 66	3 53	3 95	3 90	3 52	3 75	4 29	4 29	4 61	4 29	4 17	3 49	3 53	3 49	2·75	2 07	?o	6,28	3·98

MEAN VELOCITIES

Belba

[*Instruments—1"*

Serial No	Date 1879	2 Depth: At Gauge	Variation	Date of Soundings	Central	Hyd-Mean	Surface-Breadth	Wet Border	Area	3 Fall of Water-Surface: Upper 1 mile	Lower 4 miles	Local Slope: Left Bank	Right Bank	4 Wind: From: Direction	Velocity	To: Direction	Velocity	5 Timekeeper's Initial
1		h			H	R	b	B	A	F_1	F_4	s	s					
201.	27·3	7 54	− 07	26 3	9·89	9 1	168 5	197·0	1810·6	? 72	4 05	175	18	..	0	..	0	A
	9 1	50	00	8 1	63	·03	6	196·2	1772·	?	?	19	20	..	0	..	0	A
	10·1	44	− 02	„	57	8 98	4	1	1761·2	?	?	185	200	S	6	..	0	F
	11 1	44	+ 03	„	57	·06	4	1	1761·2	?	?	200	205	S	8	..	0	A
	17 3	29	− 02	19·3	48	93	3	·6	1756·	67	3 90	180	17	N	1	N	1	F
δ Range,		33	..	..	41	26	2	9	54 1	?	?	025	030	..	..	..	.	
ν Means of 5		7 44	.	..	9·63	9·02	168 4	196 4	1772 4	? 70	?3·05	191		S 1				
Series 202										·66	3 81	170	190	..	0	..	0	A
										?	?	200	220	N	7	NW	[illegible]	A
										?	?	205	20	..	0	..	0	F
										?	?	20	20	N	3	NW	4	A
										·98	3 50	180	18	..	0	S	7	F
	23·1	98	00	„	64	71	·0	·4	1702 4	?	?	20	210	NW	11	NNW	[illegible]	A
	„	·94	00	20·1	·60	68	187 9	3	1694 8	?	?	205	210	..	0	..	0	F
δ Range,		26	..	..	48	23	3	1 1	51 1	?	?	035	035	..	.	..	.	.
ν Means of 7.		7·03	..	..	9 43	8 72	188·0	195 6	1706·0	? 62	?3 70	200		NNW 3				.
Series 203	23·3	6·90											16	..	0	S	11	F
	20·3	·86	−										18	..	0	..	0	F
	15 3	83	+										19	..	0	N	4	F
	16·1	79	+										20	S	3	..	0	F
	23·2	79	−										1	..	0	N	4	A
	14·3	78	−										?	..	0	..	4	A
	25·1	·76											23	N	1	..	0	F
	25·2	73	−										190	N	1	N	7	F
	27·1	70											210	S	1	..	0	A
δ Range,		20	..	..	27	33	·2	1	67	7·63	? 31	030	?070	..	..	..	.	
ν Means of 9.		6·80	..	..	9·00	8 47	181 8	19 3	16 4·	?·90	?3·51	?191		S 1				.

SILT.

in Tube-Rods.]

6																	7	8	9
MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations).																	CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY.	SILT in grains per cub foot.
Left of centre.								Centre.	Right of centre.										
Edge	Side-slope m	90	80	70	60	40	20		20	40	60	70	80	90	Side-slope m	Edge	D	V	
?	·28	30	·50	·42	·41	·58	·20	·31	62	·20	·40	·43	·42	·18	·67	?	398	·27	7954
?	2 04	2 44	3 02	3 21	3 17	3 21	3 17	3 24	3 33	3 24	3 22	3 14	3·07	2 42	2 04	?	5,611	3 17	7319
[illegible]	2·14	2 28	3 06	2 91	3 16	3·31	3 21	3 43	3 30	3 23	3 13	3 06	2 82	2 55	2 11	[illegible]	5,425	3 19	129
[illegible]	2 03	2 48	3 09	2 97	3 14	3 00	3 35	3 23	3 28	3 21	2 96	3 41	3 14	2 32	2 04	[illegible]	5,301	3 13	129
?	·20	·20	55	·50	·40	31	29	·38	·41	·17	.38	·50	·41	·68	·38	?	282	·19	2918
?	2·02	2 38	2 98	3 16	3 18	3 18	3 25	3 19	3 28	3 22	3·04	3 16	2 92	2 26	2 10	?	5,329	3 12	600
?	34	·28	·33	·68	·41	51	·40	·64	·50	·36	59	·37	·41	·79	·42	?	558	·29	948
?	1 95	2·28	2 88	3 05	3 16	3 15	3 15	3 19	3 17	3·24	3 09	3 13	2 83	2 16	1·97	?	5,112	3·09	436

MEAN VELOCITIES

BELRA

[*Instruments—1"*

	1	2								3				4				5
		DEPTH								FALL of Water-Surface				WIND.				
												LOCAL SLOPE		From		To		
Serial No.	Date, 18[illegible]9	At Gauge, A	Variation.	Date of Soundings	Central, H	Hyd. Mean, R	Surface-Breadth, b	Wet Border, B	Area, A	Upper 1 mile, F_1	Lower 4 miles, F_2	Left Bank, s	Right Bank, s	Direction	Velocity	Direction	Velocity	Timekeeper's Initial
Series 204	13-3												20	S	1	..	0	F
	21 3												18	..	0	..	0	F
	18-2												205	N	1	..	0	F
	27 2												180	..	0	..	0	A
	22 3												19	..	0	..	0	A
	17-2												21	N	1	N	1	A
	27 2												18	..	0	N	1	F
	0-2												20	..	0	..	0	A
	24 3												19	..	0	..	0	F
	28 1												22	..	0	..	0	F
	28 2												23	..	0	N	1	A
	21 2												205	..	0	N	1	F
	6-2												20		0	N	1	A
	22-2												19	..	0	..	0	A
Range,		26	..	..	30	20	3	1·1	41 3	33	56	035	150	..	..	..	.	
Means of 14		6 40	..	..	8·71	8 21	187 5	191 7	1398·1	73	3·23	198		N 1				
Series 205	7 2	6 37	− 02										21	..	0	N	1	F
	30-1	33	00	2									20	..	0	..	0	A
	8-2	3	00										20	N	1	..	0	A
	4 2	·28	00										20	..	0	..	0	F
	10-2	37	00	1									0	..	0	..	0	F
	31-1	21	00	2									23	ENW	7	NW	5	F
Range,		16	..	..	14	24	2	4	41 2	0 35	·40	025	030	..	..	..	..	..
Means of 6,		6 30	..	..	8 57	7 96	187 3	194 4	1553 2	0·87	3 15	208		NW b N 1				..
Series 206.	3-2	6 02	00											..	0	..	0	A
	7 3	5 94	− 03											..	0	..	0	F
	8-3	·92	·00											..	0	..	0	A
	6-3	91	00											N	1	..	0	A
	11-2	88	− 05	1										..	0	..	0	F
	3-3	86	+ ·03											N	6	N	5	C
	13-3	82	00	1										..	0	N	1	A
	4 3	82	00											V	1	N	1	F
	11-3	·7	− 03	1										..	0	N	1	A
	14 3	74	00	1										..	0	..	0	A
	10-3	·74	− ·03	1										.	0	..	0	F
	15-3	·72	·00	1										E	5	..	0	F
Range		30	..	..	31	31	3	9	43 6	31	78	030	030	..	..	..	.	
Means of 1		5 84	.	..	8 10	7 60	186·8	133 3	1168 8	72	2 74	200		N b E 1				

AND CUBIC DISCHARGES **TABLE LI.**

SITI

tin Tube Rods]

6																	7	8	9
MEAN VELOCITIES past each vertical [Each Velocity is the mean of three observations].																	CUBIC DISCHARGE In cub feet per sec	MEAN VELOCITY	SILT In grains per cub foot.
Left of centre								Centre	Right of centre										
Edge	Side-slope m	90	50	0	60	40	20		20	48	60	+0	80	Side-slope 90	m	Edge	D	V	
?	26	47	42	65	61	53	43	47	24	·43	57	38	70	40	44	?	223	20	1203
?	1 91	2 21	2 89	2 91	3·03	3·08	3 13	3·07	3 20	3 15	3 10	2 97	2 80	2 01	1 93	?	4,810	3 01	304
																			241
																			66
																			96
																			561
																			108
																			139
?	30	17	42	24	38	·19	72	26	37	25	31	51	28	33	32	?	108	04	495
7	1 89	2 24	2 98	3 05	3 14	3 18	3 20	3 10	321	3 23	3 11	307	2 68	2 07	1 83	7	4,766	3 07	202
																			99
																			138
																			5233
																			58
																			818
																			81
																			99
																			127
																			48
																			111
																			123
																			219
7	34	42	54	48	·41	31	67	56	37	50	41	52	·31	60	44	7	518	27	51
?	1 75	2 12	2·72	2 88	2 92	3 04	2 97	2 99	3·08	3·06	2 96	2·92	2·64	1·93	1·67	7	4,292	2·9	

MEAN VELOCITIES

JAOLÍ

[*Instruments—1"*

Serial No.	Date 1879	At Gauge	Variation	Date of Soundings	Central	Hyd Mean	Surface-Breadth	Wet Border	Area	Upper ½ mile	Lower 5 miles	Left Bank	Right Bank	Direction	Velocity	Direction	Velocity	Timekeeper's Initial
1		2								3				4				5
		Depth								Fall of Water-Surface.		Local Slope.		Wind				
														From		To		
		A			H	R	b	B	A	F_1	F_2	S	S					
Series 211.	27 3	7 32	– 12	26-3	8 61	7 97	192 9	200·6	1599 6	55	5 57	165	165		0	..	0	S
	7-1	28	– 02	4 1	67	86	8	4	1574 0	30	?	173	183	W	3	W	7	R
	"	28	– 05	"	67	86	8	4	1574 0		?	173	185	W	[illegible]	..	0	S
	9-1	28	+ 01		·67	86	8	4	1574 0	36	5 58	178	?	W	[illegible]	W	[illegible]	S
	8 1	25	00		64	83	8	3	1568 2	35	?	183	183	N	4	W	7	R
	10-1	16	·00		55	75	7	1	1550 6	38	5 46	175	185	N	6	NE	7	R
	11 1	14	+ 02		53	73	7	1	1546 9	40	5 44	180	175	E	4	W	[illegible]	S
	6 1	10	·00		49	70	7	·0	1539 3	39	?	180	180	S	5	W	9	S
	17-3	07	– 04	19-3	42	82	6	·0	1564·4	32	5 42	150	153	NW	10	W	20	R
δ Range,		25	..	..	25	27	3	6	60 3	23	? 16	033	7030	.		.	.	
σ Means of 9		7 21	.	.	8 58	7 82	192 8	200 2	1565 7	39	75 49	7174		NW b W 2				
Series 212	18 8	6 86	–							33	5 21	148	155	W	[illegible]	SW	9	R
	21 1	76	–							33	5 11	165	175	..	0	S	4	S
	24 2	74	–							33	5 19	150	145		0	S	13	S
	22-1	68	–							31	5 13	170	173	NW	7	W	17	R
	23-1	·64								·33	5 09	165	175	NW	4	W	25	S
	25-2	60								27	5 10	143	148	..	0	N	8	R
δ Range		26			23	28	2	7	53 8	08	12	027	033	..	.	..	.	
σ Means of 6		6 71	.	.	8 11	7 46	192 3	199 2	1485 4	32	5 14	160		W b S 5				
Series 213	25-2									30	5 12	148	148	N	6	NW	6	S
	17 1									35	4 99	158	?	W	11	W	14	R
	25 3									31	5 08	160	168	E	17	E	1	S
	15-3									29	4 95	140	143	SW	5	W	[illegible]	R
	16 1									32	5 00	163	165	.	0	W	4	S
	18-2	33	00	19 2	68	17	9	3	1421 4	26	4 28	143	130	N	4	N	8	S
	17 2	31	+ 02	"	66	15	9	3	1417 [illegible]	23	4 16	140	143	N	6	W	4	R
δ Range,		·26	.	.	57	35	2	6	79 [illegible]	12	96	025	7038	..	.		.	
σ Means of 7		6 45	.	..	7 73	7 22	192·0	198 6	1434 6	29	4 80	7148		N b W 2				
Series 214	20-3									28	4 94	145	160	W	8	W	11	S
	25-1									33	4 76	140	155	W	6	W	1	R
	27 2									24	4 28	135	148	W	10	NW	15	S
												135	148	W	10	NW	20	R
	20-2									29	4 85	133	125	NW	16	W		R
	28-2									25	4·84	143	143	NW	10	W	35	S
	27 1									32	4 87	150	158	E	6	E	[illegible]	S
	13-3	11	+ 32	12-3	[illegible]	7·06	7	·0	1397 0	28	4 86	163	155	..	0	N	11	D
δ Range,		18		..	14	16	1	4	33 2	09	66	030	035	.		.	.	
σ Means of 8		6 21	..	..	7·61	7·05	191 8	198·0	1335 8	28	4 70	146		WNW 9				

Site

[in *Tube-Rods*]

6																					7	8
Mean Velocities past each vertical (Each Velocity is the mean of three observations)																					Cubic Discharge in cub. feet per sec	Mean Velocity
Left of centre										Centre	Right of centre											
Edge	Side-slope 95	92½	87½	82½	75	67½	60	40	20		20	40	60	67½	75	82½	87½	Side-slope 92½	95	Edge	D	V
																					4,754	2 97
																					4 634	2 93
																					4 671	2 97
																					4 813	3·06
																					4 660	2 97
																					4 643	2 99
																					4 590	2 97
																					4 416	2 87
																					4,493	2 87
?	·34	26	38	24	53	38	33	27	23	50	41	32	42	20	43	14	27	·35	40	?	397	19
?	2 01	2 21	2 41	2 73	3 05	3·10	3 05	3 06	3 00	3 05	3·03	3 02	2 90	2 94	2 98	2·58	2 30	2 03	1 89	?	4,681	2 96
																					4,384	2 88
																					4 476	3 01
																					4 830	2 90
																					4,488	3 05
																					4 328	2 95
																					4,135	2 82
?	38	30	45	45	50	51	32	36	51	51	39	35	46	41	62	26	12	·11	26	?	353	25
?	1 94	2 16	2 38	2 71	2 86	3 01	3 05	3 13	3 06	3 05	3 01	3 09	2 89	2 88	2 64	2·09	2 10	1 90	1 74	?	4,357	2 94
																					4,190	2 87
																					4,201	2 94
																					4,20[illegible]	2·91
																					4,146	2 82
																					4,0[illegible]	2 98
																					4 00[illegible]	2·81
Edge	1 73	2 01	2 40	2 48	2·61	2 65	2 94	2 86	2 97	2 97	3 09	3 03	2 70	2 54	2 48	2 10	1 83	1 66	1 41	Edge	3,923	2 77
?	26	35	51	30	42	50	25	51	29	35	31	33	31	28	36	34	38	40	43	?	286	21
?	1 88	2 07	2 32	2 60	2 83	2 85	2 95	3·07	2 96	3 04	3·04	3·01	2 70	2·65	2 69	2 32	2 02	1 83	1 68	?	4,10[illegible]	2 87
																					3 98[illegible]	2·81
																					4 024	2·89
																					3 920	2·81
																					3 90[illegible]	2·79
																					3,844	2·74
																					3 840	2·77
																					3,970	2·87
																					3,940	2·82
?	37	23	47	·46	38	38	55	42	37	44	39	·43	47	50	31	53	23	13	26	?	184	15
?	1·83	1 95	2 31	2 63	2·81	2 94	2·90	3 02	2 93	2 94	2 93	3·00	2·78	2·60	2 49	2·17	1 94	1 75	1·61	?	3,92[illegible]	2·81

MEAN VELOCITIES

JAOLI

[*Instruments*—1"

1		2								3				4				5
		DEPTH								FALL of Water-Surface.				WIND.				
												LOCAL SLOPE.		From		To		
Serial No.	Date 1879	At Gauge	Variation.	Date of Soundings	Central	Hyd Mean	Surface-Breadth	Wet Border	Area	Upper ¼ mile	Lower ¼ mile	Left Bank	Right Bank	Direction	Velocity	Direction	Velocity	[illegible]
		h			H	R	b	B	A	F_1	F_2	S	S					
Series 215	24-3	6·09	+·01	29-3	7·3[illegible]	6·89	191·4	197·4	1363·1	·42	4·83	14[illegible]	14	W	20	W	12	S
	21-3	·02	−·06	17-3	·40	·92	·6	·1	136[illegible]	·27	4·70	143	14	W	8	W	14	[illegible]
	21-3	·03	·00	19-2	·32	[illegible]	·6	·6	1363·5	·51	4·62	13[illegible]	13	..	0	S	[illegible]	S
	22-3	·01	·00		·36	[illegible]	·6	·6	1360·1	[illegible]	4·46	130	12	..	0	NW	1	B
	22-3	·01	+ ·02	17-3	·36	·60	·6	·6	1360·[illegible]	·28	4·70	14[illegible]	14	SW	5	SW	17	B
	13-1	5·86	+·05	13-1	·36	·67	·5	·5	1317	17	4·61	1[illegible]	17	S	[illegible]	W	[illegible]	B
	12-1	·82	−·04	22-1	·20	·76	·5	·4	13[illegible]	·24	4·[illegible]	150	14[illegible]	..	0	SW	[illegible]	S
	14-1	[illegible]	+·05	13-1	6·97	·60	·4	·3	131[illegible]·4	·26	4·63	133	170	W	[illegible]	W	11	B
	7-2	[illegible]	·00	5-2	7·22	·76	·4	·2	1332·4	·22	3·90	130	140	SW	10	W	11	B
	10-2	[illegible]	−·01	12-2	·30	·62	·4	·1	1333·7	23	3·93	132	13[illegible]	..	0	S	[illegible]	S
Range		·23	..	..	·43	·32	·3	·7	65·9	·23	1·09	0[illegible]5	04	..	..	..	.	
Means of 10		5·97	..	..	7·27	6·79	191·5	197·3	13[illegible]0·5	·2[illegible]	4·33	143		WbS 7				
Series 216.	15-1	5·74	+ ·06	13-1	6·83	6·4[illegible]	191·3	197·0	127[illegible]·8	·40	4·33	16[illegible]	17	N	0	..	0	S
	30-1	·74	·00	29-1	7·07	[illegible]	·3	·0	12[illegible]	[illegible]	4·4[illegible]	15[illegible]	14[illegible]	..	0	W	6	B
	6-2	·74	·00	6-2	·09	·63	·3	·0	1311·4	[illegible]	3·[illegible]	145	14	W	14	W	[illegible]	B
	[illegible]	·63	·6[illegible]	"	·00	[illegible]	[illegible]	196[illegible]	129[illegible]	·24	3·7[illegible]	140	14	W	9	SW	10	S
	4-2	·62	·00	"	6·97	[illegible]	[illegible]	[illegible]	12[illegible]	·27	3·87	13[illegible]	13	N	[illegible]	S	4	S
	31-1	[illegible]	·00	29-1	·93	·47	[illegible]	[illegible]	12[illegible]1	29	4·3[illegible]	1[illegible]	13	W	20	W	[illegible]	S
	[illegible]	[illegible]	+·0[illegible]	[illegible]-3	·93	·51	·1	[illegible]	12[illegible]	·20	4·33	145	14	..	0	NNW	[illegible]	S
	[illegible]	[illegible]	+ ·10	"	·93	·4[illegible]	·1	·5	12[illegible]	·24	4·[illegible]	13[illegible]	147	..	0	SW	[illegible]	B
	6-3	·5[illegible]	·00	"	·92	·4[illegible]	·1	·6	126[illegible]	·27	4·32	13[illegible]	15[illegible]	SW	11	W	10	B
Range		·23	..	..	·36	·31	·3	·4	43·6	·20	·76	033	011	..	.	..	.	
Means of 9		5·64	..	..	6·97	6·55	191·2	19[illegible]	12[illegible]4·[illegible]	·27	4·19	144		WbN [illegible]				·
Series 217.	3-3	5·42	·00	5-2	6·77	6·37	191·0	196·3	12[illegible]0	·22	3·67	133	13[illegible]	SW	11	SW	17	B
	4-3	·41	+ ·04	5-3	·51	[illegible]	·0	·3	1246·[illegible]	1[illegible]	4·26	13[illegible]	13	SW	6	W	2[illegible]	B
	14-3	·32	·00	12-3	·55	·36	190·9	·1	1247·[illegible]	·20	3·[illegible]4	13[illegible]	13	..	0	N	[illegible]	B
	11-3	·3[illegible]	− ·0[illegible]	"	·55	·31	[illegible]	·1	12[illegible]3	[illegible]	3·52	13[illegible]	1[illegible]	E	4	SE	4	B
	15-3	·34	− ·04	"	[illegible]	·32	[illegible]	·0	12[illegible]·1	23	3·4[illegible]	143	13	W	14	W	2[illegible]	S
	11-3	·21	·05	12-3	·72	·20	[illegible]	·0	1214·6	·23	4·06	13[illegible]	13	E	11	SE		B
Range		·21	..	..	13	17	·3	3	33·6	·03	·77	·010	02	..	..	..	.	
Means of 6		5·36	..	..	6·80	6·32	190·9	196·1	1240·[illegible]	·21	3·76	140		WSW 6				

Site

tin Tube Rods

6																					7	8
Mean Velocities past each vertical [Each Velocity is the mean of three observations]																					Cubic Discharge in cub feet per sec.	Mean Velocity
Left of centre										Centre	Right of centre											
Edge	Side-slopes m	Side-slopes 9¼	87½	82½	75	67½	60	40	20	Centre	20	40	60	67½	75	82½	87½	Side-slopes 9¼	Side-slopes m	Edge	D	V
																					3 922	2 88
																					3 701	2 70
																					3 766	2 76
																					3 758	2 76
																					3 876	2 8[illegible]
																					3 787	2 95
																					3 640	2 73
																					3 707	2 8[illegible]
																					3 66[illegible]	2 68
																					3,617	2 77
?	28	40	33	24	39	45	33	56	41	35	36	20	42	45	37	41	40	22	20	?	355	27
?	1 76	1 88	2 18	2 57	2 78	2 87	3 01	2 92	3 00	2 93	2 97	2 9[illegible]	2 74	2 60	2 48	2 18	1 99	1 72	1 59	?	3,740	2 80
																					3 62[illegible]	2·84
																					3 68[illegible]	2 84
																					3,584	2 73
																					3,32[illegible]	2 57
																					3,37[illegible]	2 62
																					3 410	2 69
																					3 491	2 72
																					3 360	2 64
																					3,304	2 68
?	33	33	32	41	49	36	48	51	40	45	38	32	23	34	44	59	35	31	32	?	36[illegible]	27
?	1 70	1 93	2 21	2 47	2 59	2 82	2 87	2 83	2 87	2 91	2 93	3 91	2·66	2 44	2 27	2·05	1 85	1 69	1 44	?	3,47[illegible]	2 70
																					3,246	2·60
																					3,292	2 64
																					3,294	2 64
																					3 290	2 64
																					3,233	2 61
																					3,202	2 64
?	31	23	16	29	22	39	34	42	37	24	50	·34	32	27	23	32	31	27	31	?	92	04
?	1 67	1 79	2 04	2·38	2·44	2 60	2 74	2 87	2 87	2 84	2 83	2·84	2 45	2 29	2 14	1 89	1 66	1·56	1 43	?	3,2[illegible]	2·63

MEAN VELOCITIES

KAMHERA

[*Instruments*—1"

Serial No	1	2								3				4				5
		DEPTH								FALL of Water-Surface				WIND				
												LOCAL SLOPE		From		To		
	Date 1879	At Gauge	Variation	Date of Soundings	Central	Hyd Mean	Surface Breadth	Wet Border	Area	Upper 2¼ miles	Lower 8¼ miles	Left Bank	Right Bank	Direction	Velocity	Direction	Velocity	Timekeeper's Initial
		A			H	R	b	B	A	F_1	F_2	S	S					
221	6 2	6 56	+ 03	5 2	5 66	4·91	65 6	69 8	342	2 82	11 89	294	286	NNW	18	NNW	15	cl
	7 2	51	00	,	61	87	5	6	339 0	2 85	11 84	299	294	N	13	N	5	o
	4-2	44	02		54	82	1	4	334 5	2 79	11 78	303	291		0	N	4	o
	3-2	34	− 02		44	74	5	2	327 5	2 87	11 68	306	289	NNW	14	NW	7	cl
δ Range,		22			22	17	2	6	14 4	08	21	012	008		.			
Means of 4		6 46		.	5 56	4·84	65·5	69 5	336·0	2·83	11 80	295		NNW 9				
Series 222	20-3	6 21	− 01	19 3	5 74	4 76	66 3	69 9	332 9	2 89	11 69	274	260	N	11	N	11	cl
	31 1	20	+ 01	29 1	78	62	65 4	1	318 8	2 93	11 65	296	277	NNW	10	N	2	o
	30 1	15	00	"	23	58	3	68 9	315 5	2 98	11 61	301	277		0	NW		cl
	27 1	14	00	,	22	·57	·3	9	314	2 89	11 58	291	279	N	7		0	cl
	28 1	12	00		20	·55	3	8	318 6	3 01	11 58	301	294		0	N	7	o
	25 1	11	00	20 1	36	54	4	8	312 4	2 92	11 54	291	276	NNW	9	NNW	10	o
	4 1	03	00	1 1	27	47	0	4	305 6	3 00	11 49	308	286		0		0	o
		02	00		26	46	·0	4	305 9	3 02	11 48	308	280		0	N	7	o
	8-1	·02	00		26	46	0	4	305	3 01	11·48	313	291	NNW	7	NNW	11	cl
	15-1	00	00	13-1	24	42	0	4	301 6	3·03	11 56	311	28		0	.	0	cl
		·01	+ 02	,	25	42	1	4	309 4	3 12	11 57	311	289		0	N	7	o
	17 1	01	− 02		13	42	1	4	302 4	2 97	11 47	301	262	N	10	N	15	cl
		00	00		11	49	·0	4	301 8	2 98	11 46	301	269	N	15	N	21	o
	9-1	5 99	− 02	1 1	23	44	64·9	3	303 9	2 94	11 50	308	285		0		0	cl
	10-1	98	− 01	1 1	22	43	9	·3	30 6	2 95	11 48	316	299	N	7	N	7	o
δ Range,		23			63	34	1 4	1 6	31 [illegible]	30	23	042	039					
Means of 15		6·07			5 27	4 50	65 [illegible]	68 7	309 [illegible]	2·97	11 54	291		N b W 6				
Series 223	14 1	5 93	− 01	13-1	5 17	4 36	64·9	68 2	297 9	3·00	11 49	303	287	N	13	N	13	cl
		92	00		16	35	9	1	296·6	2 99	11 48	303	28	NW	10	NW	6	o
	21-3	·89	00	19 3	42	59	65 5	9	311 8	2 99	11 45	296	279	N	13	N	15	o
	2 -3	86	00		41	52	5	9	311	2·60	11 38	296	279	NW	12	NW	11	cl
	8 2	80	00	5-2	4 90	33	64 3	67 7	293·0	2 78	11 36	311	306	N	7	N	7	cl
	25 3	75	− 01	26-3	5 13	40	8	68·3	300·4	2 63	10·71	291	279	E	9	E	5	cl
	27 2	75	− ·01	26 2	4 94	34	6	1	295	2 90	11 07	306	301	NW	8	NW	11	o
		7	00	,	93	33	6	1	294	2 91	11 06	306	301	NW	8	NW	11	cl
	28 2	72	00	"	93	33	·6	1	294	2·81	10 98	294	308	NW	10	NW	11	o
	18-1	71	00	13-1	·82	19	4	67 5	293 0	2·96	11 27	318	306	N	15	N	10	cl
	24-3	69	+ ·02	26-3	5·07	·35	8	68·1	296	2 64	11 35	294	289	NW	11	NW	10	o
δ Range,		24		.	60	33	1 2	1 4	28·6	40	73	027	036					
Means of 11		5·79			5·08	4·37	64 8	68 2	[illegible]	2 84	11 21	297		NNW 9				

SITE

tin Tube Rods]

6																		7	8
MEAN VELOCITIES past each vertical (Each Velocity is the mean of three observations)																		CUBIC DISCHARGE in cub. feet per sec	MEAN VELOCITY.
Left of centre.								Centre	Right of centre.										
Side-slope m	Side-slope 27½	25	22½	20	15	10	5		5	10	15	20	22½	25	Side-slope 27½	Side-slope m	Edge	D	V
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	981 6	2 87
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	967 0	2 85
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	948·0	2 83
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	945 8	2 88
15	36	09	38	21	39	50	·42	43	35	22	33	14	50	18	41	·15	?	35 8	05
1 95	2 47	2 74	2·96	2 95	3 07	2 93	2 88	3 09	2 84	3 07	3 01	3 06	2 98	2 74	2 39	1 93	?	960 6	2 86
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	908 6	2 72
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	921 4	2 89
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	899 6	2 85
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	898 6	2 85
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	877 0	2 80
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	879 8	2 82
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	863 7	2 82
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	862 7	2 83
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	898 7	2 94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	834 6	2 77
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	845 0	2 79
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	862 6	2 85
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	859·2	2 85
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	830·5	2 74
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	824 6	2 73
58	38	49	55	53	50	62	55	51	52	46	34	53	39	48	49	68	?	96 8	22
1 77	2 33	2 71	2 85	2 82	2 87	2 88	2 92	2 94	2 94	2 98	3·00	2 98	2 88	2 68	2·42	1 93	?	871·0	2 82
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	875 2	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	847	2 86
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	838 4	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	862	2·77
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	841	2 87
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	817 0	2·72
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	823	2 79
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	817 7	2·78
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	817 0	2·77
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	803 1	2 64
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	800 0	2·70
90	46	52	38	44	52	70	28	56	37	79	48	45	38	44	·52	66	?	75 1	26
1 72	2 35	2 77	2 80	2·78	2 87	2·90	2 93	2 88	2 94	2 92	2 93	2 91	2 87	2·64	2 32	1 82	?	821 0	2·79

MEAN VELOCITIES

KAMHERA

[*Instruments—1"*

Serial No	1 Date 1872	2 Depth At Gauge A	Depth Variation	Depth Date of Soundings	Depth Central H	Depth Hyd Mean R	Surface Breadth b	Wet Border B	Area A	3 Fall of Water-Surface Upper 2¼ miles F_1	Fall of Water-Surface Lower 8¾ miles F_2	Local Slope Left Bank S	Local Slope Right Bank S	4 Wind From Direction	Wind From Velocity	Wind To Direction	Wind To Velocity	5 Timekeeper's Initial
Series 224.	21 1	5 61	00	20 1	4 86	4 16	64 3	67 3	280·0	2 05	11 22	316	303	.	0	.	0	c
	22 1	61	00		86	16	3	3	280 0	2 02	11 25	313	301	N	13	N	13	cl
	10 2	55	00	12 2	84	17	2	4	281 2	2 78	11 16	316	306	V	l	V	l	c
	11 2	55	00	,	84	17	2	4	281	2 78	11 21	313	301	..	0	V	l	cl
	4-3	53	·00	5-3	80	23	5	·8	286 0	2 73	11·05	303	311	V	l	NW	15	cl
	22 2	54	00	10-2	84	24	4	·8	287 1	2 79	11 18	308	291	..	0	.	0	c
	27 3	54	00	26 3	92	23	·4	7	266 8	2 60	11 10	301	277	..	0	..	0	c
	13-2	53	00	12 2	82	16	·1	3	279	2 80	11 10	313	294	N	14	N	14	c
	3-3	53	00	5 3	78	22	5	7	285 6	2 70	11 00	303	311	NW	10	NW	17	cl
	24-2	·47	·00	26 2	68	14	1	3	278 0	2 74	11·07	306	290	..	0	V	l	cl
	25-2	45	00	"	66	12	0	3	277 3	2 78	11·00	306	299	..	0	V	l	cl
	"	·45	00	"	·66	12	·0	3	277·0	"	"	306	29	..	0	V	l	c
δ Range,		16	..	..	26	·12	·5	5	9 8	26	25	015	034	..	..	..	.	
ε Means of 12		5 53	.	..	4 80	4 18	64 3	67 5	281 8	2 79	11 12	304		NNW 4				
Series 225.	14-2	5·41	·00	12 2	4 70	4 07	63 9	67·0										
	8 3	41	+ 01	5-3	66	12	64 2	4						..		..		
	18-2	40	00	19 2	70	13	1	3										
	17 2	39	00	,	69	·12	1	3										
	10-3	37	- 02	12 3	48	05	1	3										
	13 3	36	00	"	47	·05	1	2										
	11 3	35	00	"	·46	·05	1	2										
	7 3	33	00	5-3	58	·06	1	2						..				
	15-2	32	00	12 2	61	·09	63 7	66 7										
	17 3	·31	- 01	19 3	84	08	61 1	67 1										
	15 3	30	00	12 3	·41	01	63·5	·0										
	20-2	28	00	19-2	58	·04	5	·0										
	6-3	28	00	5-3	53	02	64·0	·0										
	18-3	27	- 02	19 3	80	·05	1	·0	271	2 71	10·3	·06	291	..	0	V	4	cl
δ Range,		14	..	..	43	13	5	7	11	13	32	024	020	..	..	..	.	
ε Means of 14		5·31	..	..	4 61	4·05	64·0	67 1	273	2 7	10 64	20		NbW 3				

AND CUBIC DISCHARGES

TABLE LV.

SITE

in *Tube Rods*]

6																			7	8
Mean Velocities past each vertical (Each Velocity is the mean of three observations)																			Cubic Discharge in cub feet per sec	Mean Velocity
Left of centre									Centre	Right of centre										
Edge	Side-slope		25	22½	20	15	10	5		5	10	15	20	22½	25	Side-slope		Edge	D	V
	m	27½														27½	m			
																			774 0	2 76
																			794	2 84
																			768 0	2 73
																			772 4	2 73
																			797	2 78
																			809 0	2 82
																			764 5	2 63
																			785 7	2 81
																			780 2	2 73
																			744 1	2 67
																			747	2 70
																			745 1	2 69
?	57	67	35	40	40	69	41	33	28	33	41	50	35	36	27	56	69	?	64 9	21
?	1 66	2 24	2 67	2 74	2 79	2 83	2 84	2 90	2 01	2 88	2 88	2 87	2 85	2 74	2 52	2 18	1 63	?	772	2 74
																			746 2	2 74
																			734 1	2 64
																			760 7	2 74
																			776	2 80
																			743	2 70
																			736	2 68
																			747 7	2 73
																			733	2 69
																			739	2 ,3
																			738	2 69
																			725 8	2 68
																			737	2 73
																			711 4	2 64
	1 50 1 15	[illegible] 2 05	[illegible] 2 34	2 83	2 61	2 80	2 80	2 78	2 56	2 61	2 91	2 88	2 75	2 75	2 70	2 27	[illegible]		719 4	2 65
?	·64	43	52	29	35	60	34	58	34	39	35	31	30	31	31	26	·26	?	65 5	16
?	1 60	2 17	2 00	2 67	2 72	2 83	2 79	2 85	2 77	2 80	2 81	2 80	2 69	2 78	2 55	2·19	1·54	?	739 4	2 71

AVERAGE CROSS-SECTIONS, MEAN VELOCITIES AND CUBIC DISCHARGES. TABLE LVI.

SITES IN DISTRIBUTARIES

[*Instruments—11′ Sounding Rod, and 1″ tin Tube-Rods*]

AVERAGE SOUNDINGS AND MEAN VELOCITIES for each vertical

[Each Average Sounding (H) is the mean of six soundings in a Float-Course.
* The Range of the Soundings is the difference between the greatest and least sounding in a Float-Course.

[Each Velocity is the mean of three observations]

	1	2								3	4				5	6														7	8	9
		DEPTH									WIND						Left of centre							Right of centre						CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY	SITE
											From		To																			
Serial No	Date, 1879	At Gauge	Variation	Date of Soundings	Central	Hyd Mean	Surface-Width	Wet Border	Area	Fall of Water-Surface	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Nature of work	Edge	10	8	6	4	2	Centre	2	4	6	8	10	Edge			
		A			H	R	b	D	A																					D	V	
	28-3	3 11	·00	28-3	2 58	2·00	22 0	23 5	46 9	?	..	0	..	0		Depths * Range		97 1 1	2 25 3	2 40 4	2 47 3	2 57 4	2 58 5	2 52 2	2 48 1	2 40 0	2 07 1 0	80 1 4	.. ..	..	.. ..	RIGHT JAOLI DISTRIBUTARY, Gauge on Right Bank 100 below Site
231.	29-3	4 35	·00	28 3	3 82	2 79	25 0	27 2	76 0	?	..	0	..	0	C	Velocities	?o	1 96	2 36	2 50	2 73	2 73	2 73	2 78	2 80	2 65	2 36	1 96	?o	190 7	2 51	
	"	34	+ 02	"	·81	·79	0	2	75·8	?	..	0	..	0	B		?o	1 99	2 36	2 54	2 86	2 73	2 61	2 70	2 73	2 63	2 48	2 21	?o	191 1	2 52	
	δ Range,	01	..	..	01	00	·0	0	2	.	..	0	..	0	.		?	03	·00	04	·13	00	12	08	07	·02	12	25	?	·4	·01	
	ψ Means of 2.	4·35	..	..	3·82	2 79	25·0	27 2	75 9	.	Calm						?	1 98	2 36	2 52	2 80	2 73	2 67	2 74	2 77	2 64	2 42	2 09	?	190 9	2 52	
232	28-3	3 10	− 02	28-3	2 57	1 99	22 0	23 4	46 0	?		0	..	0	C	Velocities	?o	1 60	1 73	2 13	2 17	2 31	2 40	2 33	2 11	2 11	1·96	1 63	?o	97 7	2 10	
	"	·09	·00	"	56	98	·0	4	4	?	..	0	..	0	B		?o	1 53	1 82	1 99	2 26	2 38	2 24	2 26	2 26	1·96	2 04	1 58	?c	97 7	2 10	
	δ Range.	01	..	..	·01	01	0	0	·2	..	..	0	..	0			?	07	09	14	09	07	16	07	15	15	08	05	?	0	00	
	ψ Means of 2,	3 10	..	..	2 57	1 99	22·0	23 4	46 5	.	Calm				.		?	1 57	1 78	2 06	2 22	2·35	2 32	2 30	2 19	2 04	2 00	1 61	?	97·7	2 10	

																	Left of centre							Right of centre									
Date.	A			H	R	b	D	A		D	V	D	V			Edge	6	5	4	3	2	1	Centre	1	2	3	4	5	6	Edge	D	V	
12 3	3·60	·00	12-3	3·08	2 10	13 8	16·9	35·5	?	..	0	..	0	·	Depths, *Range	..	? ?	2 73 6	3 13 2	3 10 2	3 12 2	3 10 2	3 08 1	3 08 3	3 07 2	3 07 ·1	3 05 3	2 08 3	1 87 1 2		.. ..	.. ..	DISTRIBUTARY, 50 below Site.
18-3	3·85	·00	18-3	3 38	2 28	14 0	17 4	39 7	?	..	0	..	0		Depths, *Range,	·	1 50 9	3 22 4	3 38 2	3 40 2	3 42 2	3 37 1	3 38 2	3 37 3	3 35 4	3 32 3	3 23 1	2 92 3	1 30 2 1	·	.. ..	.. ..	

233	13-3	4·08	+ 05	12-3	3 56	2 33	14 3	18 0	42 2	Not observed	..	0	..	0	B	Velocities	?o	1 56	1 92	2·05	2 27	2 41	2 46	2 48	2 52	2 22	2 17	2 11	1 85	1 49	?o	90·5	2 14	MAYSCPUR Gauge on Right Bank.
		05	− 15	,,	53	33	3	17 9	41 8		..	0	N	l	C		?o	1 58	2 07	2 17	2 38	2 52	2 59	2 36	2 36	2 17	2 08	2 00	1 70	1 41	?o	89 5	2 14	
	18 3	3 90	+ 00	18-3	43	31	0	5	40 4		.	0	..	0	C		?o	1 79	2 03	2 10	2 22	1 31	2 27	2 33	2 29	2 11	2 17	2 05	1 85	1 28	?o	84 9	2 10	
	,,	85	00	,,	38	28	0	4	39 7		..	0	..	0	B		?o	1 58	1 83	2 04	2 13	2 36	2 34	2 26	2 27	2 11	2 03	1 9	1 78	1 19	?o	80 0	2 03	
	δ Range	23	..	..	18	07	3	6	2 5	?	.. ..		.. ..		.		?	23	24	13	25	21	32	22	25	11	14	20	15	30	?	9 9	11	
	v Means of 4	3 37	..	..	3 48	2 32	14 2	17 7	41·0	?	N l				.		?	1 63	1 96	2 09	2 25	2 40	2 42	2 36	2 36	2 15	2 11	2 02	1 80	1 35	?	80 4	2 10	
234	12 3	3 60	00	12 3	3 08	2 10	13 8	16 9	35 5	?	..	0	..	0	C	Velocities	?o	1 36	1 92	1 99	2 16	2 34	2 29	2 29	2 26	2 19	2 04	1·97	1 85	1 38	?o	72 0	2 05	
	14-3	4 10	·00	14 3	2·43	1 83	14·0	16 7	30 9	?	..	0	..	0		Depths *Range,	.	2·03 5	2 37 3	2 37 2	2 42 2	2 40 3	2 45 3	2 43 2	2 40 2	2 43 3	2 40 4	2 43 4	2 48 3	2 08 8	..	.. ..	..	MIRANPUR DISTRIBUTARY, 1 Mile below head, Gauge on Left Bank 3 miles below Site
235	14-3	3 75	− 70	14-3	2·08	1·63	14·0	15·9	20·0	?	..	0	..	0	B	Velocities	?o	1 75	1 80	1 78	1 91	1 76	1 65	1 67	1 58	1 55	1·38	1 29	1 35	1 34	?o	41 4	1 59	
	21 3	3 83	00	21 3	1 40	1 16	13 5	14·6	17 0	?	..	0	W	l		Depths *Range,	: .	72 5	1 37 ·3	1·37 2	1 37 ·1	1 38 1	1 42 1	1 40 2	1 38 1	1 38 1	1 35 1	1 35 1	1 40 2	1 12 ·8	.	.. ..	.. .	
235	21 3	3 83	00	21-3	1 40	1 16	13 5	14 6	17 0	?	W	l	W	l	B	Velocities	?o	1 22	1 48	1 44	1 55	1 34	1·60	1 58	1 65	1 54	1 49	1 44	1 30	1 30	?o	28 8	1 49	
	,,	3 83	+ ·01	,	40	16	5	6	0	?	NW	b	NW	h	C		?o	1 32	1 53	1 55	1 58	1·64	1·63	1 60	1 54	1·55	1 53	1 46	1 43	1·35	?o	25·7	1·49	
	δ Range,	00	..	..	00	00	00	0	0		.. ..		.. .				?	10	05	11	03	·10	·03	·02	·11	01	04	·02	04	05	?	4	00	
	v Means of 2,	3 83	..		1 40	1 16	13 5	14 6	17·0	..	WNW b						?	1 27	1 81	1 50	1 57	1 59	1 62	1 59	1 60	1 55	1 51	1 45	1 41	1·33	?	28 5	1 40	
	19-3	3 75	00	19-3	3 33	2 15	13 0	15 9	34·0	?	..	0	..	0	..	Depths *Range,	.	? ?	2 41 8	1 05 3	3 27 4	3 33 4	3 32 4	3 33 3	3 35 3	3 32 3	3 15 2	2 72 5	1 55 1 0	? ?	..	.. ..	.. ..	PIMORA DISTRIBUTARY. Gauge on Left Bank, 14" below S ta.
237	19-3	3 79	− 01	19 3	3 37	2 16	13 0	16 0	34 5	?	NW	b	W	l	C	Velocities	?o	?	1 63	1 86	1 80	1 92	2 05	2 13	2 03	1 91	1 76	1 73	1 38	?	?o	62 8	1 82	
	,,	78	+ 00	,,	36	16	0	15 9	4	?	NW	l	NW	l	B		?o	?	1 70	1 84	1 90	1 96	2 00	2 08	1 97	1 99	1 82	1 75	1 46	?	?o	63 3	1 84	
	δ Range,	01	..	..	01	00	0	1	1	.	.. ..		.. ..				?	?	07	02	10	04	05	05	06	08	06	·02	08	?	?	5	02	
	v Means of 2.	3 79	..	..	3 37	2 16	13 0	16 0	34 5		NW b						?	?	1 67	1·83	1 80	1 94	2 03	2 11	2 00	1 95	1 79	1 74	1 42	?	?	63 1	1 83	
238	20-3	3 37	− 02	19 3	2 95	1 96	12 5	14 9	29 2	?	..	0	W	l	B	Velocities	?o	?	1 53	1 68	1 76	1 94	2 08	2 03	2 04	1 89	1 65	1·62	1 33	?	?o	52 2	1 79	
	,,	28	− 06	,,	86	91	5	7	28 0	?	W	l	W	l	C		?o	?	1 49	1 55	1 68	1 83	1 86	1 92	1 90	1 83	1 73	1 52	1·25	?	?o	47 9	1 71	
	δ Range	09	..	..	09	05	0	2	1 1	.	.. ..		.. ..				?	?	04	·13	03	11	22	11	14	06	08	10	08	?	?	4 3	08	
	v Means of 2	3 33	..	..	2 91	1 94	12 5	14 8	28 0		W l				.		?	?	1 51	1 62	1 72	1 89	1 97	1 98	1 97	1 86	1 69	1 57	1 29	?	?	50 0	1 76	

SURFACE, BED AND MEAN VELOCITIES AND DISCHARGES. TABLE LVII.

SOLÁNI RIGHT AQUEDUCT

[*Instruments—3" Surface-Floats, 3" Double-Floats, and 1" wood Rods*]

For explanation of this Table see pages 37 47. Series 241 is a reprint from Nos. 84 85; Series 242 from No. 66, Series 243 partly from No. 111; the work of 14-2-76 in Series 243 is new matter

	1	2					3		4				5	6																	7	8	
		DEPTH.					FALL of Water-Surface		WIND					SURFACE, BED AND MEAN VELOCITIES taken in succession past each vertical. Series 241, at the surface; Series 242, about 10½" above the bed; Series 243, Bed velocities (each Velocity is the mean of three observations).																	DISCHARGE past each Transversal in sq. ft. per sec.	MEAN VELOCITY past each Transversal	
									From		To			Left of centre.									Right of centre										
Serial No.	Date, 1876.	Central.	Variation.	Hyd. Mean.	Surface-Breadth.	Length of Instrument.	Upper 5 miles.	Lower 41 miles.	Direction.	Velocity.	Direction.	Velocity.	Timekeeper's Initial	42½	40	37½	35	32½	30	20	10	Centre	10	20	30	32½	35	37½	39½	42½			TRANSVERSAL.
		H		h	b	l	F_1	F_2																							D	$\frac{U_o}{V}$ & $\frac{U_m}{V}$	
241	10·2	8·93	+·03	7·41	83·7	..	5·73	5·00	SW	4	NW	15	H	?0	3·03	3·39	3·51	3·95	4·11	4·14	4·14	3·97	4·20	4·22	4·05	3·49	3·24	3·13	2·65	?0	325·2	3·83	SURFACE
	18·2	8·78	+·03	7·30	83·9	.	5·92	4·85	..	0	SSW	23	W	?0	3·09	3·82	3·64	3·97	4·03	4·03	4·11	4·05	4·17	4·05	3·59	3·26	3·16	3·01	2·59	?0	320·0	3·78	
δ Range,		·17	..	·11	·2	..	·17	·12	..	..	..	..	..	?	·06	·43	·13	·02	·08	·09	·03	·08	·03	·17	·46	·23	·08	·12	·06	?	4·3	·05	
n Means of 2.		8·87	..	7·36	83·8	..	5·84	4·94	SW b W 7				..	?	3·06	3·61	3·58	3·96	4·08	4·10	4·13	4·01	4·19	4·14	3·82	3·38	3·20	3·07	2·62	?	323·0	3·81	
242	10·2	8·93	+·08	7·41	83·7	8	5·73	5·00	SW	4	NW	15	H	?0	2·97	3·49	3·37	3·59	3·66	3·70	3·64	3·70	3·75	3·75	3·64	3·33	3·11	3·16	2·50	?0	298·2	3·51	BED.
	18·2	8·78	+·05	7·30	83·9	8	5·92	4·88	..	0	SSW	23	W	?0	3·14	3·31	3·43	3·68	3·51	3·73	3·85	3·57	3·85	3·70	3·55	3·24	3·35	2·83	2·78	?0	295·5	3·48	
δ Range,		·17	..	·11	·2	0	·17	·12	..	..	..	..	..	?	·17	·18	·00	·09	·15	·03	·21	·13	·10	·05	·09	·09	·24	·33	·28	?	2·7	·03	
n Means of 2.		8·87	..	7·36	83·8	8	5·84	4·94	SW b W 7				..	?	3·06	3·40	3·40	3·64	3·59	3·72	3·75	3·64	3·80	3·73	3·60	3·29	3·23	3·00	2·64	?	296·9	3·50	
243	10·2	8·93	+·08	7·41	83·7	8	5·73	5·00	SW	4	NW	15	H	?0	3·23	3·75	3·75	3·85	3·92	3·90	3·97	4·00	4·17	4·05	3·97	3·66	3·41	3·33	2·91	?0	321·5	3·79	MEAN.
	18·2	8·78	+·05	7·30	83·9	8	5·92	4·88	..	0	SSW	23	W	?0	3·33	3·53	3·97	3·82	3·85	3·82	4·12	4·05	4·14	3·90	3·73	3·66	3·41	3·28	3·21	?0	318·5	3·75	
δ Range,		·17	..	·11	·2	0	·17	·12	..	..	..	..	..	?	·10	·22	·22	·03	·07	·08	·14	·05	·03	·15	·24	·00	·00	·05	·30	?	3·0	·04	
n Means of 2.		8·87	..	7·36	83·8	8	5·84	4·94	SW b W 7				..	?	3·28	3·64	3·86	3·84	3·89	3·86	4·04	4·03	4·16	3·98	3·85	3·66	3·41	3·31	3·06	?	320·3	3·77	

TABLES LVIII.—LXX.

CENTRAL SURFACE AND MEAN VELOCITIES.

Soláni Left Aqueduct Site, ...	Series	101 to 107,	Table	LVIII.
Soláni Right Aqueduct Site, ...	,,	108 to 127,	Tables	LIX.—LXI.
Soláni R. Aqueduct (with L. Aqued. closed),	,,	131 to 139,	,,	LXI.
Soláni Embankment Main Site, ...	,,	151 to 181,	,,	LXII.—LXIV.
Fifteenth Mile Sites, ...	,,	191 to 197,	,,	LXV.
Belra Site, ...	,,	201 to 206,	,,	LXVI., LXVII.
Jaolí Site, ...	,,	211 to 217,	,,	LXVII., LXVIII.
Kamhera Site, ...	,,	221 to 225,	,,	LXIX.
Distributaries, ...	,,	231 to 238,	,,	LXX.

column, viz —

δ, "Range" (i.e., difference between the greatest and least) of the quantities in the Sub-column.

v, Mean of the quantities in the Sub-column.

(N.B.—Col. 4 is incomplete in many Series (in the Roorkee Reach), the "Means" in this Column are in such cases queried (?) as not being strictly comparable with the rest (though otherwise correct in themselves)).

Explanation of the Columns.

Col.	Head.	Symbol.	Detail.	
2	State of Regulation.	Q λ F_1 F_2 F_3	Number of Gates and of Ocees (small Gates) open in Dhanauri Dam. Number of Gates closed in Dhanauri Regulator. Withdrawal by Distributaries near Tail of Reach, in cub. ft. per sec. Average Height of (temporary) Obstruction across Falls at Tail of Reach (i.e., sum of heights of obstructions in each bay of the Falls — num	controlling Supply into Roorkee Reach. controlling exit at Tail of Reach. of ch.
3	Rod Velocity Results	R δ v D V	Mean (Sectional) Velocity, i.e., the quotient D — A.	
				incomplete many cases in Roorkee Reach].
				ope not ed in the ibutaries, e LXX].
		O	Value of ratio V ⟵ 100 (RS)$^{\frac{1}{2}}$.	
6	Silt.	σ	Silt-Density at mid-channel (in grains per cub. ft.), given for Belra Site only.	

TABLE LVIII.

CENTRAL SURFACE AND MEAN VELOCITIES.

Soláni Left Aqueduct

Serial No.	1	2							3												4								5					
		Control.					Fall of Water-Surface		Rod Velocity Results												Central Surface Velocity Results								Surface-Slope Results.					
		Headworks Dhanauri			Tail Asafnagar								Wind.										Wind.							Wind				
													From		To								From		To									
	Date, 1877-78-9	Gates open in Dam.	Ogees open in Dam.	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction	Upper ½ mile.	Lower ½ mile.	Hyd. Mean Depth	Variation of water level	Surface-Breadth	Length of Rod	Direction.	Velocity	Direction	Velocity	Timekeeper's Initial	Cubic Discharge in cubic feet per sec	Mean Velocity	Hyd Mean Depth.	Variation of water level	Direction	Velocity.	Direction.	Velocity	Central Surface Velocity (mean of 45 trials)	Ratio V ÷ v_0	Hyd Mean Depth	Direction.	Velocity.	Surface-Slope (Left Bank)	Value of $100\sqrt{RS}$	Ratio V — w
					Q	k	F_1	F_2	R		b	l						D	V	R						v_0	c	R			S	w	c
101.	14-12-78	0	0	0	260	·00	5 9·	5 57	7 99	− ·03	82·0	9	NE	4	S	9	cl	3,429	4·03	No Observations.								7 99	NE	4	·183	3·82	1·035
	20-12 ,,	0	0	0	228	·00	5 87	5·43	92	− ·01	·5	9	..	0	W	3	cl	3,441	4·12									92	..	0	·195	3·93	1·048
	19-12- ,,	0	0	0	228	·00	5·03	5·47	91	− ·03	·0	9	SE	1	NE	5	c	3,409	4·04									·93	SE	1	·190	3·88	1·041
δ Range,		0	0	0	33	·00	·05	14	·05	..	·5	0	..	..	..	..	..	32	09									07	..	..	012	11	·014
ε Means of 3		0	0	0	241	·00	5 92	5 49	7 94	..	82 2	9	SEbE 1				.	3,426	4 06									7 94	NE 1		189	3·88	1 048
103.	23-5-78	0	0	0	153	00	5 92	5 15	7 69	00	82 5	9	W	6	NW	7	R	3,107	3 86	No Observations.								7 69	W	6	205	3 97	·972
	12-4- ,,	0	0	0	100	00	5·93	4 71	·63	+ ·12	·5	9	SEbS	7	NE	8	R	3,107	3 88									62	SEbS	7	198	3 88	1·000
	27-5- ,,	0	0	0	123	·00	5·90	5 10	64	00	·5	9	SWbW	8	SW	8	T	3 126	3 91									·64	SWbS	8	210	4 01	975
	15-4 79	0	0	0	115	00	5 83	5 22	62	+ ·03	·5	8½	NW	7	SW	12	R	3,034	3 82									62	NW	7	215	4·05	·943
δ Range,		0	0	0	53	·00	·10	51	·07	..	0	5	..	..	..	.	..	92	09									07	..	..	017	·17	057
ε Means of 4,		0	0	0	123	·00	5 91	5·05	7 65	..	82 5	8 9	SWbW 3				..	3,091	3 87									7 64	SSW 4		207	3 98	·978

105	6-4 78	0	0	0	146	00	5 93	4 74	7 23	00	84 0	8	NW	2	W	5	T	2 781	3 78	No Observations								7 23	NW	1	225	4 03	933
	20-3- ,,	0	0	0	0	·00	5 86	4 54	14	– 12	1	8	SW	1	..	0	R	2,629	3 61									18	SW	1	218	3 96	914
	δ Range	0	0	0	146	00	07	20	09	..	·1	0	..	..	..	.	.	152	·16									05	..	..	007	07	024
	ν Means of 2	0	0	0	73	00	5·30	4 04	7 19	..	84 1	8	W & N 2					2,705	3 70									7 21	NW 1		222	4 00	·926
106.	21-3-76	0	0	0	0	00	5 81	4·30	6 90	00	85·0	7¼	SE	3	..	0	T	2 405	3 54	..	.	..	.	..	.	?	?	6 90	SE	3	220	3 90	908
	12 3- ,,	0	0	0	0	·00	5 85	4 20	77	00	·0	7¼	SE	6	SE	2	T	2 377	3 50	.	..	..	.	..	.	?	?	77	SE	0	210	3 77	928
	6-3-77	0	2	0	113	00	5 92	4 28	75	·00	0	7¼	..	0	..	0	W	2 328	3 45	6 75	00	..	0	N & E	7	4 05	847	75	..	0	188	3 56	963
	δ Range	0	2	0	113	·00	·11	19	15	..	·0	0	..	..	..	..		137	11	?	..	..	..	..	..	?	?	15	..	..	32	34	·055
	ν Means of 3,	0	⅔	0	57	00	5 86	4 20	6 81	..	85 0	7¼	SE 2				.	2,300	3 49	?6 75	..	? N & E 4				?4 05	? 847	6 81	SE 3		206	3 74	933
107.	9 3-75	0	0	0	0	00	5 89	3 96	6 46	+ 02	85 0	7	..	0	N	3	T	2,230	3 47	No Observations.								6 45	..	0	220	3 77	920
	8 3- ,,	0	0	0	0	·00	5 92	3 93	43	– 03	0	7	SW	9	NW	4	R	2 228	3 48									45	SW	9	223	3 79	918
	11-3- ,,	0	0	0	0	·00	5·94	3 91	·42	00	0	7	..	0	..	0	R	2,211	3 46									42	..	0	235	3 83	893
	7-3- ,,	0	0	0	0	00	5 90	3·90	41	00	0	7	S	6	..	0	T	2,163	3 42									41	S	6	223	3 78	·905
	δ Range,	0	0	0	0	00	05	06	·05	..	·0	0	..	..	..	..	..	47	·06									04	..	..	015	11	028
	ν Means of 4,	0	0	0	0	·00	5·91	3 93	6·43	..	85 0	7	SW & W 1				..	2,213	3 40									6 43	SSW 4		225	3 61	909

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LIX.

Solani Right Aqueduct

Serial No.	1 Date, 1875–76	2 Control. Headworks: Gates open in Dam	Gates open in Dam	Gates closed in Regulator	Tail Assistance: Withdrawn by Distributaries Q	Average Obstruction on a	Fall of Water Surface: Upper 5 miles F_1	3 Rod-Velocity Results: Variation of water-level	Surface-Breadth b	Length of Rod l	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Timekeeper's Initial	Discharge in cub. feet per sec. D	Mean Velocity V
Series 108	31-5-76	0	0	0	306	·00	5·83	− ·02	82·0	9½	..	0	NE	8	W	3,828	3·91
	5-6-76	0	0	0	290	7·00	5·80	·00	·0	9	..	0	S	6	W	3,340	3·93
	14-12-76	0	0	0	266	·00	5·87	·00	·0	9	S	9	..	0	cl	3,631	4·39
	17-6-76	0	2	0	302	7·00	5·87	·00	·0	9	NE	6	NE	14	W	3,528	4·16
	14-6- ,,	0	0	0	303	7·00	5·83	+ ·02	·0	9	NE	6	NE	8	H	3,424	4·04
	5-6-76	0	0	0	05	·00	5·82	·00	·0	9½	SW	7	N	8	W	3,28[illegible]	3·99
	6-6 ,,	0	0	0	84	·00	5·82	·00	·0	9½	.	0	..	0	F	3,35[illegible]	3·96
	20-12 ,,	0	0	0	228	·00	5·88	− ·01	·5	9	W	4	SW	12	cl	3,719	4·22
	[illegible]-12 ,,	0	0	0	228	·00	5·93	·00	·0	9	NE	5	NE	7	O	3,444	4·11
	17-[illegible]-76	0	0	0	206	7·00	5·83	− ·03	·0	9	..	0	NE	7	W	3,318	3·95
	Range,	0	2	0	205	7·00	·17	·	·5	·5	..	..	.	..	·	338	·39
	Mean of 10,	0	⅕	0	233	7·00	5·86		82·1	9·2	NE 1				·	3,429	4·00
109	23-7-76	0	0	0	318	·00	6·07	+ ·05	82·5	9	..	0	SSW	8	R	3,577	4·39

Serial No.	Date, 1875–76	4 Central Surface-Velocity Results: Hyd. Mean Depth h	Variation of water level	Wind From: Direction	Velocity	Wind To: Direction	Velocity	Central Surface Velocity (Mean of 15 trials) v_0	Ratio $V - v_0$ ρ	5 Surface-Slope Results: Hyd. Mean Depth h	Wind: Direction	Velocity	Surface-Slope (Right Bank) S	Value of $100\sqrt{hS}$ u	Ratio $V - u$ c
Series 108	31-5-76	8·01	+ ·01	.	0	.	0	4·55	·855	8·00	..	0	169	3·89	1·005
	5-6-76	7·99	·00	.	0	..	0	4·53	·868	7·99	.	0	185	3·85	1·021
	14-12-76		..	.	.	..	..	?	?	·97	S	9	175	3·74	1·150
	17-6-76	7·97	·00	W	10	NE	6	4·59	·906	·97	ENE	1	195	3·94	1·056
	14-6- ,,	·96	·00	N	8	NE	6	4·48	·902	·96	W	1	190	3·89	1·033
	5-6-76	·97	·00	..	0	SW	7	4·52	·883	·97	..	0	191	3·90	1·023
	6-6 ,,	·97	·00	..	0	..	0	4·51	·876	·97	..	0	188	3·87	1·023
	20-12 ,,	·	..	..	.	..	.	?	?	·92	SW	10	205	4·03	1·047
	[illegible]-12 ,,		..	..	.	..	.	?	?	·90	NE	1	200	3·98	1·033
	17-[illegible]-76	7·91	·00	.	0	.	0	4·43	·892	·91	..	0	180	3·77	1·048
	Range,	·10	..	..	..	..	.	·16	·047	·10	..	..	030	·29	·145
	Mean of 10,	7·97	..	ENE 1				4·52	·884	7·96	SW 2		190	3·89	1·045
109	23-7-76	No Observations								7·80	..	0	198	3·93	1·107

Series 109	3-5-77	0	0	0	62		4 9	7 80	00	82 5	9	NE	6	..		00	.	0	NE	12	4 43		. 0
	19 11	0	0	0	306		5 28	79	00	·5	9	V	/	..		00	..	0	V	5	4 65		. 0
	11-5 76	0	0	0	238	?	5 43	79	− 05	5	9	..	0	..		00	..	0	..	0	4 44		. 0
	15 5 „	0	2	0	208	?	5 43	79	00	5	9	..	0	.		00	..	0	..	0	4 34		. 0
	12 5 „	0	3	0	208	?	5 40	77	00	5	9	NE	11	NE	1.	00	..	0	NE	11	4 39		. 0
	3 6 „	0	0	0	289	?	5 36	73	− ·12	5	9	..	0	NE	1	00	..	0	.	0	4 46		. 0
	2 6 „	0	0	0	289	?	5 32	72	− 04	5	9	E	5	NE		00	V	/	V	/	4 43		0
	12-4 78	0	0	0	100		4 81	·71	00	5	9	V	12	E	2	..		..	..	.	?		23
	16 5 76	0	0	0	208	?	5 35	70	00	·5	9	..	0	NE	1	·00	NE	11	.	0	4 46		0
δ Range.		0	3	0	244	?	62	10	..	·0	0	..	..	.	.	..	..	.		..	? 41	?	..
υ Means of 9		0	½	0	212	?	5 26	7 70	..	82 5	9	NE&E 5				..	? NE 2				?4 44	?	.3
110	8-8 78	0	0	0	333		4 94	7 63	− 03	82 5	8¼	..	0	..	.	− 05	V	/	..	0	4 78		/
Series 110	28-5 78	0	0	0	133		5 12	7 65	00	82 5	9	NW	/	V		..	..	..	..	.	?		/
	15 4 75	0	0	0	113		5 27	65	+ 05	·5	8¼ 9	V	/	SW	1	..	..	..	..	..	?		V 12
	8-5 76	0	2	0	238	?	5 25	64	00	5	9	.	0	NE	1	+ 03	..	0	..	0	4 23		. 0
	27 5 ,	0	0	0	123		5 06	63	00	5	9	S	8	SW	1	..	..	..	..	..	?		V 13
	8-6 ,	0	0	0	250	?	5 15	63	− 22	5	9	NE	10	N	.	00	..	0	..	0	4 46		0
	1 5 ,	0	5	0	213	?	5 30	62	− 03	·8	9	..	0	..	.	00	..	0	..	0	4 38		. 0
	8-5 „	0	2	0	213	?	5 25	61	00	83 0	9	..	0	..	.	00	..	0	..	0	4 25		. 0
	2 5 „	0	5	0	213	?	5 2	61	00	·0	9	..	0	..	.	− 03	..	0	..	0	4 34		0
	28 4 „	0	2	0	233	?	5 27	59	00	1	9	..	0	..	.	00	..	0	..	0	4 33		0
	20 4 „	0	4	0	213	?	5 25	58	00	·1	9	..	0	..	.	00	..	0	..	0	4 40		0
δ Range		0	5	0	174	?	23	07	..	7	5	..	..	.	.	..	..	..	..	..	? 23	?	..
υ Means of 10,		0	2	0	200	?	5 23	7 62	..	82 8	9	SSW /				..	? Calm				?4·34	?	V 3
110	20-4 77	0	0	0	0		5 10	7 58	00	83 1	9	..	0	N	1	+ 01	..	0		0	4 39		0
Series 111.	25-4 78	0	0	0	40		4 90	7 46	00	83 6	8¼	N	7	..	.	..	..	..	..	..	?		10
	20-4 „	0	0	0	0		4 91	43	00	6	8¼	..	0	..	.	..	..	..	..	..	?		. 0
	„ „	„	„	„	„		4 92	45	00	6	8¼	..	0	..	.	00	..	0	..	0	4 29		. 0
	26-4 „	0	0	0	40		4 90	44	00	6	8¼	N	9	V		00	SW	3	NW	9	4 34		11
	15-7 76	0	0	0	299	?	4 95	43	+ 01	·6	8	..	0	E	1	00	..	0	..	0	4 58		. 0
	13 11 77	0	0	0	305		4 40	42	− 02	7	8½	N	8	..	.	00	..	0	V	/	4 37		0
	23 5 76	0	0	0	181	?	4 90	41	00	7	8	..	0	SW		+ 02	W	4	NE	6	4 37		0
	14 7 „	0	0	0	299	?	4 90	38	00	7	8	..	0	..	.	00	..	0	..	0	4 45		0
δ Range,		0	0	0	305	?	52	08	..	·1	5	..	..	..	.	..	..	..	..	..	? 29	?	..
υ Means of 8,		0	0	0	146	?	4 87	7 43	..	83 6	8 3	NE&N 2				..	? NW 1				?4 40	?	V 2

TABLE LIX.

CENTRAL SURFACE AND MEAN VELOCITIES.

Solání Right Aqueduct

Serial No.	1	2							3											4								5					
		CONTROL.					Fall of Water-Surface		Rod-Velocity Results.											Central Surface Velocity Results								Surface-Slope Results					
		Headworks Dhanau I.			Tail Asafnagar								Wind									Wind							Wind				
													From		To							From		To									
	Date, 1876 — 78	Gates open in Dam.	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	Average Obstruction a	Upper 5 miles F₁	Lower 4½ miles F₂	Hyd Mean Depth R	Variation of water level	Surface Breadth s	Length of Rod l	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cubic D Squares in cub feet per sec. D	Mean Velocity V	Hyd Mean Depth R	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of 15 trials) v_0	Ratio V — v_0 c	Hyd Mean Depth R	Direction	Velocity	Surface-Slope (Right Bank) S	Value of 100 √RS w	Ratio V — w c
Series 109	31-5-76	0	0	0	306	00	5 80	5·60	8·00	− 02	82 0	91	..	0	NE	3	W	8,828	3 91	8 01	+ 01	..	0	..	0	4 55	839	8 00	..	0	189	3 89	1 005
	5-6-76	0	0	0	290	7 00	5 80	5 70	7·99	00	·0	9	..	0	S	5	W	3,340	3 93	7 99	00	..	0	..	0	4 53	868	7 99	..	0	185	3 85	1 021
	14-12-78	0	0	0	206	00	5 97	5·5?	97	00	0	9	S	9	..	0	Cl	3 6?1	4 10	·	..	..	.	..	..	?	?	97	S	9	175	3 74	1 160
	17-6-76	0	2	0	302	7 00	5 87	5 68	97	00	·0	9	NE	6	NE	14	W	8,628	4 10	7 97	00	V	10	NE	6	4 59	900	07	ENE	1	195	3 94	1·056
	14-6- „	0	0	0	302	7 00	5 83	5·6	97	+ 02	·0	9	NE	6	NE	8	H	3 424	4 04	96	00	E	8	NE	6	4 48	902	96	V	1	190	3 89	1 030
	5-6-76	0	0	0	03	00	5 82	5·5?	·97	·00	0	91	SW	7	N	8	W	3 385	3 99	97	00	..	0	SW	7	4 52	·882	97	..	0	191	3 90	1·023
	6-6- „	0	0	0	93	00	5 82	5·5?	·97	00	·0	91	..	0	..	0	F	3,355	3 96	97	00	..	0	..	0	4 51	878	·97	..	0	188	3 87	1·023
	20-12-78	0	0	0	228	00	5 88	5·42	·91	− 01	·5	9	W	4	SW	12	Cl	3 519	4 22	..	..	..	.	..	..	?	?	92	SW	13	205	4 03	1 047
	19-12- „	0	0	0	225	00	5 93	5·4?	90	00	0	9	NE	5	NE	1	G	3 444	4 11	·	..	..	..	..	..	?	?	90	NL	1	200	3 98	1 033
	17-5-76	0	0	0	208	7 00	5 83	?	90	− 03	·0	9	..	0	NE	7	W	3,313	3 95	7 91	00	..	0	..	0	4 43	892	91	..	0	180	3 77	1 048
	Range.	0	2	0	205	7 00	·17	? 28	10	..	5	5	..	..	..	..	..	338	30	? 10	..	..	..	..	.	? 16	? 047	·10	..	..	030	29	145
	Mean of 10.	0	½	0	233	7 00	5 86	5·59	7·96	..	82 1	9·2	NE 1				·	3 429	4·06	?7 97	..	? ENE 1				?4 52	? 884	7 96	SW 2		190	3 89	1·045
109	23-7-78	0	0	0	318	00	6·07	5 23	7 82	+ 05	82·5	9	..	0	S8W	8	R	3,577	4 35	No Observations								7 80	..	0	198	3 93	1 107

Series 109	3 5-7,	0	0	0	62			4 9	7 80	00	82 5	9	NE	6	..	00	.	0	NE 1	..	0	982
	19 11	0	0	0	306			5 28	79	00	5	9	V	l	.	00	..	0	V	..	0	1 035
	11 5 76	0	0	0	233	?		5 43	79	− 03	5	9	..	0	.	00	..	0	..	..	0	990
	15 5 „	0	2	0	208	?		5 43	79	00	5	9	.	0		00	..	0	..	..	0	1 016
	12 5 „	0	3	0	208	?		5 40	77	00	5	9	NE	11	NE 1	00	..	0	NE 1	..	0	1 000
	3 6- „	0	0	0	289	?		5 30	75	− ·12	5	9	..	0	NE 1	00	..	0		..	0	1 021
	2 6-	0	0	0	289	?		5 32	72	− 04	5	9	E	5	NE	00	V	l	V		0	1 003
	12-4 78	0	0	0	100			4 81	71	00	5	9	V	12	E 2	..	.			E	23	1 031
	16 5 76	0	0	0	208	?		5 30	70	00	5	9	..	0	NE 1	·00	NE	11	..		0	979
c Range,		0	3	0	244	?		62	10	..	0	0	..	..	..	..	..		.		..	050
b Means of 9		0	⅓	0	212	?		5 36	7 76	..	82 5	9	NE b E 5			..	? NE 2			E 3		1 006
110	8 8 78	0	0	0	333			4 94	7 63	− 03	82 0	8½	..	0	..	− 05	V	l	..	V	l	1 073
Series 110	28-3 78	0	0	0	153			5 12	7 65	00	82 5	9	NW	l	V	..	..	.	..	V	l	1 061
	15 4 78	0	0	0	115			5 27	65	+ 05	·5	8½ 9	V	l	SW 1	..	..	..	..	SW	12	1 010
	8 5 76	0	2	0	238	?		5 25	64	00	5	9	..	0	NE 1	+ 03	..	0	..	..	0	970
	27 5 „	0	0	0	123			5 08	63	00	5	9	S	8	SW 1	..	..	..	..	SW	13	1·020
	3-6- „	0	0	0	289	?		5 10	63	− 22	5	9	NE	10	N	00	..	0	..	.	0	1 008
	1 5 „	0	5	0	213	?		5 33	62	− 05	8	9	..	0	.	00	..	0	..	..	0	1 018
	3 5- „	0	2	0	213	?		5 25	61	00	83 0	9	..	0	..	00	..	0	..	..	0	987
	2 5 „	0	5	0	213	?		5 2	61	00	·0	9	..	0	..	− 03	..	0	.	..	0	984
	28 4 „	0	2	0	233	?		5 27	59	00	1	9	..	0	..	00	..	0	..	..	0	987
	29 4 „	0	4	0	213	?		5 25	58	00	·1	9		0	..	00	..	0	..	..	0	987
δ Range		0	5	0	174	?		23	07	..	7	5	..	..	..	..	..	..	..	..	..	·091
ε Means of 10		0	2	0	200	?		5 23	7 62	..	82 8	9	SSW l			..	? Calm			SW 3		1 004
110	26 4 77	0	0	0	0			5 10	7 58	00	83 1	9	..	0	N 1	+ 01	..	0	..	..	0	968
Series 111	23 4 78	0	0	0	40			4 90	7 46	00	83 6	8½	N	7	..	..	..	..	..	N	10	974
	20-4- „	0	0	0	0			4 91	45	00	6	8½	..	0	..	..	..	..	..	..	0	1 013
	„ „	„	„	„	„			4·92	45	00	6	8½	..	0	.	00	..	0	..	..	0	1 011
	26 4- „	0	0	0	40			4 90	44	00	6	8½	N	9	V	00	SW	3	NW	W	11	987
	15 7 76	0	0	0	299	?		4 98	43	+ 01	6	8	..	0	E 1	00	..	0	..	..	0	1 068
	13 11-7,	0	0	0	315			4 40	42	− 02	·7	8½	N	8	..	00	..	0	V	..	0	1 085
	23 5 76	0	0	0	181	?		4 90	41	00	7	8	..	0	SW	+ 02	W	4	NE	.	0	995
	14 7- „	0	0	0	299	?		4 00	38	00	7	8	..	0	..	·00	..	0	..	..	0	1 034
δ Range,		0	0	0	305	? 00	19	52	08	..	·1	5	..	..	..	..	..	..	..	..	..	092
ε Means of 8,		0	0	0	146	? 00	5·91	4 87	7 43	..	83 6	8 3	NE b N 2			..	? NW 1			NW 2		1 021

TABLE LX.

CENTRAL SURFACE AND MEAN VELOCITIES

SOLANI RIGHT AQUEDUCT

Serial No	1	2							3											4								5					
	DATE, 187	CONTROL.					FALL of Water-Surface		ROD-VELOCITY RESULTS											CENTRAL SURFACE VELOCITY RESULTS.								SURFACE-SLOPE RESULTS.					
		Headworks (Dhanauri)			Tail Analogue								WIND									WIND							WIND				
													From		To							From		To									
		Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction	Upper 8 miles	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Length of Rod	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cubic Discharge in cub. feet per sec	Mean Velocity	Hyd Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of 48 trials)	Ratio V − v_0	Hyd Mean Depth	Direction	Velocity	Surface Slope (Right Bank)	Value of 100 √RS	Ratio V − w
					Q	k	F_1	F_2	R		b	l						D	V	R						v_0	c	R			S	w	c
112	6-4 76	0	0	0	146	00	5 93	4 74	7 23	00	84·0	8	W	3	NW	3	T	2 892	3 92	.	..	..		.	..	?	?	7 23	NW	3	193	3 74	1 048
	13 7 76	0	0	0	293	? 00	5 90	4·60	11	00	1	8	.	0	NNE	8	H	2 713	3 75	7 11	00	.	0	.	0	4 43	847	11	..	0	220	3 96	947
	20-3-76	0	0	0	0	00	6·03	4 41	·06	− 13	2	8	WSW	5	WSW	1	R	2 677	3 74	.	.	..		.	..	?	?	01	WSW	1	198	3 73	1 003
δ Range,		0	0	0	293	? 00	09	33	·17	..	2	0	..	..	..	..		215	18	?	..	.		..	..	?	?	22	..	..	027	23	101
ν Means of 3,		0	0	0	148	? 00	5·94	4 58	7 13	..	81 1	8	NW 2					2 761	3 60	?7 11	.	? Calm				?4 43	?·847	7 12	NW 1		204	3 81	999
113	21 3-76	0	0	0	0	·00	5·84	4 30	6 88	00	84 3	7½	..	0	V	1	T	2 663	3 85		.	..	.	..	.	?	?	6 88	V	1	228	3 96	·972
114	4 4 76	0	6	0	67	? 00	5 80	4 31	77	00	4	7	.	0	SSW	6	W	2 447	3 69	6 77	00	..	0	..	0	3 97	907	77	..	0	205	3 73	965
	6-3-7	0	2	0	113	00	5 9	4 24	75	00	4	7½	N b E	7		0	W	2 481	3 66	75	00	..	0	..	0	4 12	88	75	..	0	195	3 63	1 008
	12 3-76	0	0	0	0	00	5 87	4 16	75	00	4	7½	..	0	SE	8	T	2 465	3 6			..	.	..	..	?	?	75	SE	8	195	3 63	1 000
115	[illegible]-6-76	0	0	0	261	? 00	5 85	4 35	73	− 06	4	7	..	0	S	5	W	2 541	3 76	6 75	00	..	0	..	0	4 28	879	75	..	0	210	3 77	997
	9 10-77	0	0	0	172	00	6 10	4 10	63	00	4	7	..	0	..	0	G	2,561	3 86	63	00	..	0	.	0	4 37	883	63	..	0	198	3 62	1 066
δ Range,		0	5	0	261	? 00	30	26	25	..	1	5	..	..	..	..	.	222	16	? 14	..	..	..	..	.	? 40	? 028	25	..	.	033	·34	101
ν Means of 6		0	1	0	102	?·00	5 90	4 26	6 75	..	84 4	7 3	SSE 1				..	2 528	3 73	6 73	..	? Calm.				?4 19	? 880	6 76	SE 1		205	8·72	1·001
116	9-3-76	0	0	0	0	00	5·90	3·95	6·45	00	84 5	7	V	1	..	0	T	2 349	3 66	..	..	..	.	..	.	?	?	6 45	..	0	203	3 62	1·011
	11-3 ,,	0	0	0	0	·00	5 95	3 90	·41	00	·5	7	..	0	..	0	R	2,305	3 63	.	..	..	..	..		?	?	41	.	0	205	3 63	997
	6-3- ,,	0	0	0	0	·00	5 9	3·90	·41	00	·5	7	NW	6	NW	1	R	2 296	3 60	..	.	..	..	..		?	?	41	NW	1	205	3 63	992
	7-3- ,,	0	0	0	0	·00	5 90	3·90	·41	00	·5	7	V	1	S	7	T	2 256	3 5	.	..	..	.	.	.	?	?	41	S	7	213	3 70	994
	8-11 76	0	0	0	237	92	6·05	2 90	·34	00	5	7	V	1	V	13	G	2,269	3 61	6 34	00	..	0	V	1	4·03	896	34	..	0	210	3 65	989
δ Range,		0	0	0	237	92	15	1 05	11	..	0	0	..	..	..	.		93	13	?	..	..	..	..	..	?	?	11	..	..	010	03	·037
ν Means of 5,		0	0	0	57	·18	5 95	3 71	6·40	..	84 5	7	SW b W 1					2,295	3·60	?6·34	.	? V 1				?4·03	? 896	6·40	S 1		207	3·65	989

117	5 11 77	0	0	0	279	00	6·00	2 60	6 15	00	85 0	6½	E	4	N	6	G	2 172	3 60	6 17	05	N	3	E	4	4 00	900	6 19	N	3	209	3 60	1 000
	21 7 76	0	0	0	151	7 00	6 12	3 76	13	+ 05	0	6		0		0	H	2 245	3 73	11	00		0		0	4 04	92	11		0	230	3 75	995
δ Range,		0	0	0	128	7 00	12	1 18	02		·0	5						73	13	06						01	023	08			021	15	005
υ Means of 2,		0	0	0	215	7 00	6 06	3 19	6 14		85 0	6 3	NE b N ?					2 209	3 67	6 14		NE b E 1				4 02	91	6 15	N ?		220	3 68	998
118	19 7 76	0	0	0	234	?	5 99	3 56	5 97	− 02	85 0	6		0	NNE	7	H	2 157	3 70	5 98	00		0		0	4 23	875	5 98		0	230	3 71	997
	12 1 78	0	0	0	22	47	5 93	3 07	83	·00	0	6	E	7	N	8	P	2 044	3 6	83	00	V	1	S	4	3 91	923	83	V	1	215	3 54	1 020
	14 1	0	0	0	22	47	6·02	3 08	83	00	0	6		0		0	P	2 002	3 53	83	00		0		0	3·96	891	·83		0	224	3 61	978
	20 7 76	0	0	0	200	?	6 05	3 45	81	00	0	6		0	N	9	W	2 093	3 59	81	00		0		0	4 3	869	81		0	230	3 66	981
δ Range		0	0	0	212	7 00	12	49	10		0	0						155	17	17						32	054	1			015	17	042
υ Means of 4		0	0	0	120	7 47	6 00	3 29	5 86		85 0	6	NNE 3					2 058	3 61	5 86		S 1				4 06	890	5 86	V l		225	3 63	994
Series 119	25 7 76	0	0	0	0	?	6 40	3 10	5 5	00	85 0	6		0		0	H	1 908	3 56	5 55	00		0		0	4 25	838	5 55		0	240	3 65	975
	16 10·78	0	0	0	234	83	6 36	2 09	50	+ 02	0	5½		0		0	P	1 974	3 72	51	00	V	l		0	4 28	869	49	·	0	180	3 14	1 185
	24 7 76	12	10	0	104	?	6 47	2 93	41	+ 05	0	5	NE	10		0	W	1 977	3 79	47	+ 10		0		0	4 22	898	51		0	270	3 86	983
	15 10·78	0	0	0	234	83	6 42	1 95	41	− 05	0	5½		0		0	R	1 963	3 77	39	− 02		0		0	4 18	902	43		0	188	3 20	1 178
	10 7	1	0	0	0	00	6 79	2 41	40	+ 15	0	5	N	6	V	15	P	1 887	3 63							?	?	32	N	6	273	3 81	953
	26 7 76	0	0	0	0	?	6 50	2 80	32	00	0	5		0		0	H	1 861	3 65	5 32	00		0		0	4 11	885	32		0	250	3 65	1·000
δ Range		12	10	0	234	7 83	49	1 12	23		0	5						113	23	? 23		·				? 17	? 074	23			093	72	232
υ Means of 6,		½	1½	0	95	7 55	6 46	2 56	5 43		85·0	5 4	NNE 1					1 929	3 69	?5 46		? V l				?4 21	?·875	5 44	N 1		234	3 55	1 046
119	9 7 78	0	0	0	0	00	6 97	2 93	5 41	+ 25	85·0	5½		0		0	R	2 107	4 04	No Observations								5·3?		0	313	4 08	090
121	14 10 78	0	0	0	234	1 08	6 17	1 5	5 02	00	85·0	5		0		0	R	1 627	3 40	5 02	00		0		0	3 83	888	5 02		0	180	3 01	1 130
	27 7 76	0	0	0	0	?	6 37	3 08	4 98	− 05	0	5		0	S	6	W	1 639	3 46	00	00		0		0	3 97	872	00		0	300	3 87	894
δ Range		0	0	0	234	?	15	1 55	04		0	0						12	06	02						14	016	02			120	86	236
υ Means of 2		0	0	0	117	?1·08	6 25	2 31	5·00		85 0	5	S 2					1 633	3 43	5 01		Calm				3·90	880	5·01	Calm		240	3 44	1·012

TABLE LXI.

CENTRAL SURFACE AND MEAN VELOCITIES

Solaní Right Aqueduct

1	1	2							3											4								5					
		Control					Fall of Water-Surface		Rod-Velocity Results											Central Surface Velocity Results								Surface-Slope Results					
		Headworks Dhansuri			Tail Amanogar								Wind									Wind							Wind				
													From		To							From		To									
Serial No.	Date	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	Average Obstruction k	Upper ½ miles F₁	Lower ½ miles F₂	Hyd Mean Depth R	Variation of water level	Surface-Breadth s	Length of Rod l	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Discharge cubic feet per sec. D	Mean Velocity V	Hyd Mean Depth R	Variation of water-level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of trials) v_0	Ratio V — v_0 c	Hyd Mean Depth R	Direction	Velocity	Surface-Slope (Right Bank) s	Value of 100 √RS w	Ratio V — w c
122	21 12 77	0	0	0	27	·47	5·65	1 75	4 07	+ ·01	85·0	4	S b W	7	·	0	O	1 030	2 72		·	·	··	·	·	?	?	4·09	··	0	195	2 82	065
	"	"	"	"	"	"	5 68	1 74	·05	00	·0	4	S	6	S b W	7	P	1 031	2 74	4 05	00	··	0	S	6	3·07	803	05	V	?	203	2 87	055
	19 12 "	0	0	0	24	67	5 63	1 70	03	00	0	4	SW	4	S	19	O	1 0 4	2 74	03	00	SW	6	SW	4	3·02	907	·03	··	0	218	2·96	020
δ Range,		0	0	0	3	00	03	·03	04		0	0	··	·	··			7	02	? 02		·	·	··	·	? 05	?·014	06	·	··	023	14	039
μ Means of 3,		0	0	0	23	07	5 66	1 72	4 05	··	85·0	4	S b W 7					1 025	2 73	?4·04		? SW b S 4				?3·05	? 900	4 06	V ?		205	2 88	013
123	23-8-76	0	0	10	0	00	6·37	2 25	4 05	+ 05	85·0	4	N	7	E	8	P	1,219	3 24	4 09	+ 02	E	8	S	10	3 72	871	4 10	··	0	243	3 16	1·025
	" "	"	"	"	"	"	6·05	1 95	3 99	+ 05	·0	3½	··	0	N	5	R	1 237	3 35	01	+ 03	N	5	N	7	3 75	867	01	N	5	260	3 23	1 006
	22 7 76	15	10	0	173	?	6·57	?1 73	97	00	0	4	S	6	SE	4	H	1,214	3 30	3 97	+ 03	··	0	·	0	3 79	871	3 95	··	0	330	3 61	914
δ Range		15	10	10	173	?·00	82	? 50	08	··	0	5	··		··	·		23	06	12	·	·		··	·	07	004	00	··	··	087	45	111
μ Means of 3,		5	3½	6½	58	? 00	6 43	?1 97	4·00		85 0	3·6	ENE 2					1,223	3·26	4·03	··	E b N 1				3·75	870	4·02	N 2		278	3·33	982
124	31 7 76	8	0	8	0	?	6·61	1 20	3 26	− 12	85·0	3	··	0	N	9	W	722 1	2 43	3 34	− 08	··	0	··	0	2 90	835	3 42	··	0	195	2 58	942
125	16-7 76	2	0	10	0	·00	7 76	·4	1 93	− 04	85·0	11	S	?	S	?	P	276 9	1·61	1 98	− 04	··	0	S	?	1·83	880	2·00	··	0	203	2·01	·801
127	11 7 76	10	0	10	0	50	7·40	?·00	69	00	84 3	4	S	11	S	8	P	305	60	No Observations								74	S	11	113	·91	·660

CENTRAL SURFACE AND MEAN VELOCITIES

SOLÁNI RIGHT AQUEDUCT—LEFT AQUEDUCT CLOSED

131	27 10 77	0	0	0	247	24 30	3·60	10	4 20	00	85·0	4	SW 6	NE 5	P	491 7	1 26	4 17	− 07	NE 5	NE 5	1 53	824	4 13	NE 5	026	1 04	1 212
	" "	"	"	,	"	"	"	"	20	·00	·0	4	.. 0	SW 6	Q	472 2	1 21	·20	00	0	· 0	1 42	852	20	.. 0	024	1 00	1 210
δ Range,		0	0	0	0	1 00	00	00	00	..	0	0	.. ..	.. ·	·	19 5	05	03	..	.. ·	· ..	·11	·028	07	.. ..	002	04	002
v Means of δ,		0	0	0	247	24 30	3 60	10	4 20	·	85 0	4	NE 2			482 0	·74	4 19	·	NE 5		1 48	883	4 17	NE 3	025	1·02	1 211
132	1 9 76	0	0	6	159	?	6 17	·08	3 67	− 04	85 0	3	.. 0	.. 0	H	1 648	4 87	3 69	00	.. 0	.. 0	5 79	841	3·69	.. 0	480	4 21	1 157
	" "	"	,	"	"	?	"	"	63	− 05	0	3	.. 0	.. 0	W	1,697	4 78	66	− 01	.. 0	.. 0	5 68	·842	66	.. 0	465	4 13	1 157
δ Range,		0	0	0	0	?	00	00	04	..	0	0	.. ..	·		51	09	03	..	.. ..	.. ·	11	001	03	.. ..	015	·08	·000
v Means of δ,		0	0	6	159	?	6 17	98	3 65	..	85 0	3	Calm.		·	1,623	4 83	3 68	..	Calm		5 74	842	3 68	Calm	478	4 17	1 157
135	21 9 78	0	0	8	71	1 33	6 22	·68	2 99	+ 03	85·0	21	.. 0	.. 0	P	865 6	3 20	3·03	+ 03	.. 0	.. 0	3 60	889	3 04	.. 0	253	2 77	1 155
136	21 9 78	0	0	8	71	1 33	6 28	62	2 94	+ 03	85·0	21	.. 0	.. 0	R	740 2	2 79	2 95	+ 02	.. 0	0	3 44	·811	2 92	.. 0	208	2 46	1 134
137	31-8 76	0	0	8	78	?	6 47	43	2 94	+ 10	83 0	3	.. 0	SW 12	H	667 8	2 51	2 63	+ ·03	.. 0	.. 0	3 19	787	2 85	.. 0	200	2 39	1 050
139	31-8 76	0	0	8	78	?	6 62	18	2 72	+ 05	85·0	2	.. 0	.. 0	W	620 7	2 54	2·68	+ 05	.. 0	.. 0	2·88	882	2 61	.. 0	145	1 95	1 303
139	20-9 78	0	0	8	50	1 24	5 89	21	2 57	− 02	85·0	2	NW 2	V 1	R	525 6	2·29	2 56	00	V 1	S 1	2 67	854	2 59	NW 1	168	2·09	1·097
	" "	"	"	"	"	"	6·00	10	47	00	0	2	V 5	S 5	P	467 0	2 11	·47	00	S 5	SSW 6	2 41	·872	47	V 1	133	1·81	1 166
δ Range,		0	0	0	0	00	11	·11	10	..	·0	0	.. ..	.. ..	..	58 6	·17	09	..	.. ·	.. ·	25	918	12	.. ..	035	28	069
v Means of δ,		0	0	8	50	1 24	5 95	10	2 52	..	85·0	2	S 1		..	496 3	2 20	2·53	..	S b W 3		2 54	863	2 53	V 1	151	1 95	1 132

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXII

Solání Embankment Main Site

1		2								3										4								5					
		Control					Fall of Water-Surface			Rod-Velocity Results										Central Surface Velocity Results								Surface-Slope Results					
		Headworks the weir			Tail Asafnagar								Wind									Wind							Wind				
													From		To							From		To									
Serial No.	Date, 1876-77	Gates open in Dam	Gates open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction	Upper 4 miles	1 mile below Site	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cub c Discharge in cub feet per sec.	Mean Velocity	Hyd Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity [illegible]	Ratio $V - v_0$	Hyd Mean Depth	Direction	Velocity	Surface Slope (Left Bank)	Value of 100 $\sqrt{RS}$	Ratio $V - w$
					Q	δ	F_1	F_2	F_3	R		b						D	V	R						v_0	c	R			S	w	C
151	14 12 76	0	0	0	266	00	4 74	1 18	5 60	9 37	− 03	171 0	E	7	..	0	A	7 364	4 09	9 35	− 03	S	7	.	0	4 61	887	9 39	E	6	280	4 65	880
	16-12 "	0	0	0	268	00	4 68	1 21	5 48	36	− 01	169 8	S	6	E	7	P	7,344	4 11	35	00	E	7	..	0	4 70	874	36	S	5	225	4 59	805
	19-12 "	0	0	0	268	00	4 70	1 23	5 42	31	− 01	·8	E & S	8	E	12	P	7,002	3 91	•				..	.	?	?	33	E	12	223	4 56	862
	"	"	"	"	"	.	4 72		5 40	33	+ 01	8	E	4	E & S	8	A	7 197	4 04				.	.		?	?	31	E	4	228	4 61	876
	20-12 "	0	0	0	265	00	4 65	1 25	5 40	30	− 01	8	S	3	W	10	A	6 940	3 91	•	•	.	.	..	..	?	?	30	S	8	228	4 61	848
δ Range,		0	0	0	3	00	09	10	20	07		1 2	.	.	.	.		424	20	?	.	.	.		.	? 09	? 013	09	..	.	007	09	047
μ Means of A		0	0	0	268	·00	4 70	1 25	5 46	9 34	..	170 0	ESE 4				.	7,169	4·02	? 93	..	? SE 3				?4 66	? 881	9 34	ESE 5		227	4 60	872
Series 152	18 12 76	0	1	0	235	? 00	4 63	1 12	5·60	9 23	00	171 0	E	17	E	16	P	6 927	3 93	9 23	+ 01	E b N	14	E	17	4 62	851	9 22	..	0	200	4 29	916
	20-12 "	0	1	0	193	1 00	4 83	1 1[illegible]	5 60	23	+ 01	·0	E	23	S	4	P	6 684	3 86	23	− 01	E	14	E	23	4 60	826	23	.	0	194	4 23	898
	[illegible]	0	0	0	123	00	4 70	1 2[illegible]	5 53	23	− 07	0	W	8		0	G	6,590	3 72	26	00	.	0	.	0	4 37	851	26	..	0	213	4 44	838
	22 1[illegible] 76	0	0	0	193	7 00	4 60	1 15	5 55	19	00	0	E	5	W	8	P	6 934	3 9	19	00		0	E	5	4 58	858	19	..	0	205	4 34	906
	19-12 "	0	1	0	235	7 00	4 81	1·09	5 65	19	− 01	0		0	SW	17	W	6 851	3 88	19	00		0		0	4 51	860	19	..	0	203	4 32	898
	15-12 "	0	1	0	235	7 00	4 81	1 14	5 65	19	00	·0	SW	9	S	23	P	6 746	3 82	18	+ 02	SW	10	SW	9	4 55	840	23	.	0	198	4 28	893
	23-12 "	0	0	0	195	7 00	4 74	1 26	5 40	18	+ 03	169 8		0	.	0	P	6 792	3 85	17	+ 01	.	0	..	0	4 49	864	17	..	0	214	4 43	876
	16-12 "	0	1	0	283	7 00	4 82	1·08	5·70	18	+ 02	171·0	ENE	12	E & S	14	W	6 746	3 84	23	00		0	ENE	12	4 63	830	23	..	0	200	4 30	893
	14 12 "	0	1	0	284	? 00	4 81	1·09	5 60	17	+ 01	169·8	SW	11	SW	25	W	6 738	3·86	16	00	S	9	SW	11	4 34	890	16	..	0	207	4 35	887
	29 12 "	0	0	0	130	? 00	4 76	1 19	5 45	13	+ 03	8	..	0		0	P	6,359	3 6	11	00	..	0	..	0	4 46	·823	11		0	213	4 41	832
δ Range,		0	1	0	162	? 00	13	18	30	10	.	1 2	.		..			545	26	15		..	.		.	29	067	15	.	.	020	21	084
μ Means of 10,		0	1	0	210	7 00	4 79	1 15	5 58	9·19	.	170 0	SSE 4					6,743	3 83	9 20	..	ESE 3				4 52	845	9·20	Calm		205	4 34	884

153.	15 4 79	0	0	0	115	00	4 60	1 22	5 23	9 00	+ 15	168 7	W	9	W	25	P	6 185	3 64	9 00	+ 04	W	6	W	15	4 32	843	8 92	W	9	265	4 86	749
	8 12 76	0	2	0	283	? 00	4 81	1·00	5 45	8 98	00	7		0	S	8	P	6 294	3 71	8 98	00		0	.	0	4 56	814	78	..	0	203	4 27	869
	28 5 78	0	0	0	123	·00	4 73	1 23	5 14	92	− 01	7	W	7	W	9	G	6 187	3 67	91	− 02	NNW	5	N	1	4 27	855	92	W	10	243	4 66	788
	12 4 „	0	0	0	100	00	4 70	1 21	4 73	90	00	7	E	8	E	8	G	6,162	3 6,		.	.		.		?	?	90	E	8	205	4 27	859
	27-5 „	0	0	0	123	00	4 68	1 24	5 08	88	− 01	7	V	1	V	9	P	6 231	3 72	8 88	− 03	WSW	16	SW	12	4 06	910	88	W	9	220	4 42	812
δ Range,		0	2	0	183	? 00	21	15	72	12	..	0						132	08	? 12	.	..	..	..	..	? 50	? 102	10	..	..	002	59	120
υ Means of 5		0	⅖	0	149	? 00	4 72	1 20	5 12	8 94	..	168 7	W b S 4					6,212	3 68	?8 94	..	? W b S 6				?4 30	? 858	8 92	W 4		227	4 50	821
154.	7 12-76	0	0	0	206	00	4 70	1 30	4 85	8 77	+ 01	167 5	..	0	..	0	P	6,239	3 81	8 77	00	..	0	..	0	4 58	832	8 77	..	0	253	4 71	809
	10 4	0	0	0	115	00	4 62	1 28	4 90	66	+ 02	5	V	1		0	G	6,869	3 63	.	.	..	.		.	?	?	65	V	1	215	4 31	·854
	7-12 7,	0	0	0	297	00	4 72	1 30	4 76	·64	+ 01	166·3	S	9	W	7	G	6,814	3 63	8 64	00	S	4	S	9	4 35	834	64	..	0	220	4 36	·833
δ Range		0	0	0	182	00	10	02	12	13	..	1 2		.	..	.	..	425	16	? 13	..	..	..	..	.	? 23	? 002	13	..	..	038	40	045
υ Means of 3		0	0	0	206	00	4 68	1 29	4 84	8 69	..	167 1	SW b S 2					5,974	3 71	?8 71	..	? S 3				?4 47	? 833	8 69	V 1		229	4·40	·832
Series 155.	8-4 76	0	0	0	128	00	4 61	1 29	4 75	8 49	+ 05	166 3	V	1	W	6	P	5 460	3 48	8 48	+ 04	W	2	NW	2	4 35	819	8 52	W	6	215	4 28	813
	28 10 „	0	0	0	240	00	5 01	1 34	4 45	48	·00	3	..	0	..	0	R	6 353	4 05	48	00	..	0	.	0	4 68	865	48	E	7	248	4 59	882
	4 4- „	0	0	0	113	·00	4 63	1 27	4 76	47	+ 01	3	W	6	.	0	P	5 617	3 56	47	− 01	W	4	W	3	4 13	867	47	W	6	217	4 29	834
	6-4 „	0	0	0	146	00	4 68	1 25	4 74	·43	00	3	W	6	W	6	G	5,379	3 45	43	00	V	1	V	1	4 12	837	43	W	6	215	4 26	810
	29-3- „	0	0	0	0	00	4 70	1 20	4 70	·41	− 02	3	W	20	W	19	P	5,365	3 45	43	00	W	19	W	23	3·86	894	42	W	20	205	4 16	829
	20 3 „	0	0	0	0	00	4 70	1 22	4 48	25	− 21	·3	SW	1	WSW	1	G	5,212	3 42	..	..	..	..	..	..	?	?	84	SW	1	190	4 07	840
δ Range		0	0	0	240	00	40	14	30	·24	..	0	..	..	..	.	..	1,141	63	? 05	..	..	..	..	.	? 82	? 075	18	..	..	049	·52	072
υ Means of 6,		0	0	0	104	·00	4 72	1 26	4 65	8·42	..	166 3	W 5				..	5,564	3 57	?8 46	..	? W 5				?4 21	? 856	8 44	W 5		217	4 28	835
156	29-1·77	0	0	0	22	7 00	8·01	2 06	8 98	8 25	− 02	165 2	..	0	E	7	W	4,930	3 26	8 25	+ 02	..	0	..	0	3 94	·827	8 25	..	0	223	4 29	·760
157.	21-3-78	0	0	0	0	00	4 59	1 23	4·38	8 11	00	164 0	SE	3	V	1	G	5 070	3 44	8 11	+ 20	..	0	..	0	4 15	829	8 11	SE	3	204	4 07	845
	3 3-77	0	1	0	22	00	4 65	1 25	4 35	02	00	0	S	4	..	0	W	4,750	3 26	02	+ 03	..	0	..	0	3 99	817	01	..	0	228	4 27	763
	6 3 „	0	2	0	113	00	4 65	1 28	4 27	7 98	+ 01	0	NW	10	..	0	W	4 594	3 18	7 98	− 01	.	0	N	1	5 99	797	7 98	..	0	215	4 14	768
	12-3 78	0	0	0	0	00	4 63	1 23	4 19	95	00	0	SE	6	SE	8	F	4 826	3 35	95	·00	SE	2	..	0	3 94	·858	95	SE	6	200	3 99	840
δ Range,		0	2	0	113	00	06	05	19	16	..	0	..	..	..	..	.	476	26	16	..	..	..	..	..	21	061	16	..	..	028	28	·082
υ Means of 4		0	¾	0	34	00	4 63	1 25	4 30	8 02	..	164 0	SE b S 1				.	4,810	3 31	8·02	..	SE 1				4·02	825	8 01	SE 2		212	4 12	804

CENTRAL SURFACE AND MEAN VELOCITIES.

TABLE LXIII.

Solani Embankment Main Site

Serial No.	1	2								3										4								5					
		Control					Fall of Water-Surface			Rod-Velocity Results										Central Surface Velocity Results								Surface-Slope Results					
		Headworks Dhanauri			Tail Asafnagar								Wind									Wind							Wind.				
													From		To							From		To									
	Date, 1876-7	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	Average Obstruction k	Upper 4 miles F_1	1 mile below Site F_2	Lower 4½ miles F_3	Hyd. Mean Depth R	Variation of water level	Surface Breadth b	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cub c Discharge in cub feet per sec. D	Mean Velocity V	Hyd Mean Depth R	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of [illegible] trials) v_0	Ratio $V \div v_0$ c	Hyd Mean Depth R	Direction.	Velocity	Surface Slope. (Left Bank) S	Value of $100\sqrt{RS}$ w	Ratio $V \div w$ C
158	13-9-76	0	0	0	197	1·00	4·73	1·17	4·35	7·88	+·23	164·0	..	0	W	17	H	4,893	3·43	7·77	·00	.	0	..	0	4·30	·798	7·77	..	0	215	4·09	839
	11-9-„	0	0	0	194	1·00	4·88	1·32	4·10	·80	−·03	·0	..	0	E	4	H	4,828	3·42	·81	+·01	..	0	..	0	4·20	·814	·80	..	0	215	4·10	834
δ Range.		0	0	0	3	1·00	15	15	25	·08	..	0	..	..	..	..	..	65	01	04	..	..	..	..	..	10	·016	03	..	.	000	·01	005
m Means of 2.		0	0	0	196	1·00	4·81	1·25	4·23	7·84	..	164·0	W 3				.	4,861	3·43	7·79	..	Calm				4·25	·806	7·79	Calm.		215	4·10	837
Series 159	6-9-76	0	0	0	207	1·00	4·85	1·35	3·95	7·71	−·04	162·8	..	0	S	14	W	4,698	3·40	7·73	·00	..	0	..	0	4·17	815	7·78	..	0	215	4·08	834
	9-3-76	0	0	0	0	·00	4·65	1·25	3·95	·67	−·02	·8	..	0	..	0	P	4,418	3·21	..	..	..	.	..	.	?	?	·68	..	0	214	4·05	793
	8-3-„	0	0	0	0	·00	4·67	1·25	3·93	·63	−·01	·8	W	10	W	7	P	4,436	3·23	..	..	..	..	..	..	?	?	·66	W	9	211	4·02	803
	7-3-„	0	0	0	0	·00	4·62	1·28	3·90	·65	·00	·8	S b W	6	W	7	O	4,373	3·19	-	..	..	..	..	.	?	?	·65	S b W	6	213	4·04	790
	12-9-76	0	0	0	195	1·00	5·64	1·16	4·05	·64	−·03	·8	..	0	NE	17	W	4,593	3·36	7·67	·00	..	0	..	0	4·16	806	·67	..	0	210	4·01	838
	11-3-76	0	0	0	0	·00	4·68	1·26	3·91	·64	−·01	·8	..	0	..	0	O	4,452	3·35	..	..	..	..	..	.	?	?	·65	..	0	218	4·08	797
	8-9-76	1	0	0	219	1·00	4·92	1·23	3·95	·62	·00	161·7	..	0	ENE	5	H	4,584	3·38	7·61	+·04	..	0	..	0	4·13	·816	·69	..	0	220	4·09	827
δ Range.		1	0	0	219	1·00	1·02	19	15	09	..	1·1	..	..	..	..	..	325	21	?·12	..	..	..	..	..	?·04	?·010	14	..	.	010	·08	·048
m Means of 7		⅐	0	0	89	1·00	4·86	1·25	3·95	7·65	..	162·6	SSW 4					4,508	3·29	?7·67	..	? Calm.				?4·15	?·814	7·66	SW b W 2		243	4·05	812
Series 160.	23-5-76	0	0	0	02	·00	4·53	1·34	3·63	7·36	+·09	161·7	..	0	V	[illegible]	O	4,162	3·19	7·31	+·03	..	0	..	0	3·56	896	7·32	..	0	218	3·99	799
	22-2-„	0	0	0	0	·00	4·68	1·31	3·66	·28	+·06	7	W	6	W	15	P	4,153	3·22	..	..	..	..	..	.	?	?	31	W	15	208	3·90	826
	„ „	„	„	„	„	„	4·71	1·34	3·50	·26	−·01	7	E b S	4	S	7	P	4,093	3·19	..	..	..	..	..	..	?	?	27	S b E	4	218	3·98	802
	„ „	„	„	„	„	„	„	„	„	·26	−·01	·7	S	3	W	6	O	4,086	3·18		..	..	..	..	.	?	?	26	W	6	213	3·93	809
	6-2 „	0	0	0	22	·00	4·71	1·27	3·47	21	·00	160·5	W	8	W b S	14	O	4,154	3·28	7·21	·00	W	8	W	8	3·71	884	20	W b S	14	210	3·89	843
	8-2-„	0	0	0	22	·00	4·65	1·29	3·41	18	−·02	·5	N	7	N	4	O	4,072	3·23	..	..	..	..	..	..	?	?	18	N	7	214	3·92	·824
δ Range.		0	0	0	02	00	·18	07	22	·18	..	1·2	..	..	..	.		90	10	?·13	.	..	..	..	.	?·15	?·12	·14	..	..	010	·10	044
m Means of 4.		0	0	0	18	·00	4·67	1·32	3·51	7·26	..	161·3	W b S 4					4,120	3·22	?7·28	..	? W 4				?3·64	?·890	7·26	W 6		214	3·94	817

161	19 2 76	0	0	0	0	·00	4 64	1 31	3·40	7 15	− 01	159 3	S 4	· 0	P	3 958	3 18		·		· ·	?	?	7 15	0	219	3 96	803
		„	„				„	„	„	15	+ 01	3	0	S 4	G	3 909	3 14	7 14	+ 01	, 0	0	3 69	851	14	0	217	3 94	797
	18 2	0	0	0	22	00	4 65	1 30	3 40	14	00	3	E b S 10	E b S 4	P	3 811	3 06		··	·	·	?	?	14	E b S 12	215	3 92	781
	20-2	0	0	0	0	00	4 63	1·32	3 40	1	− 02	3	S 9	WNW 8	G	3 834	3·07	·		·· ·	· ·	?	?	15	WNW 8	213	3 90	787
	14 2-„	0	0	0	22	00	4 68	1 27	2 90	·03	00	3	S 8	S 18	P	3 803	3 11		··	·· ·	· ·	?	?	03	S 11	219	3 92	793
δ Range,		0	0	0	22	00	05	05	30	12	·	0		·		155	12	?		·· ·	· ·	?	?	12	· ·	006	06	022
ν Means of δ,		0	0	0	9	00	4 65	1·30	3·30	7 12		159 3	S b E 4			3 863	3 11	?7 14		? Calm.		?3 69	? 851	7 12	SSE 2	217	3 93	792
162	9 11 76	0	0	0	0	? 00	5·01	1 14	3 25	6·90	+ 02	159 3	0	·· 0	W	4 015	3 36	6 90	− 03	· 0	0	3 94	853	6 91	·· 0	275	4 36	771
	2 2 76	0	0	0	22	·00	4 94	1 26	2 95	87	− 01	3	S 9	S 9	G	3 750	3 15	88	− 01	V 1	S 9	3 54	890	87	S 9	217	3 86	816
	8 11 76	0	0	0	0	? 00	5 01	1·09	3 25	77	− 02	3	· 0	0	P	4 092	3 49	77	00	·· 0	·· 0	3 91	893	77	·· 0	285	4 39	795
	24 10 „	0	0	0	19	? 00	5 25	1 10	3 15	70	− 01	3	0	ENE 7	P	3 944	3 41	70	00	0	· 0	4 26	800	70	·· 0	170	3 38	1·009
	, ,	„		,	„	,	5 27	„	3 13	·68	− 02	3	ENE 7	NE 4	W	4,062	3 52	73	+ 01	· 0	· 0	4 40	800	72	·· 0	160	3 28	1 078
δ Range		0	0	0	22	? 00	33	17	30	22	·	0	·	·		342	37	20	·	··	, ·	86	093	21	·· ·	125	1 11	302
ν Means of δ,		0	0	0	12	?·00	5 10	1 14	3 16	6 78		159 3	SE b E 2			3 973	3 39	6 80		S 1		4 01	847	6 79	S 2	221	3·85	833
163	21 10 76	0	0	0	0	?	5·07	1 23	2 70	6 25	− 01	157 0	0	· 0	H	3,342	3 15	6 25	00	·· 0	· 0	3 58	880	6 25	·· 0	155	3 11	1·013
		„	„		„	?	5 11	,	2 66	22	− 02	·0	0	S 6	W	3 286	3 12	24	− 02	·· 0	·· 0	3 31	889	24	·· 0	150	3·06	1·020
	19-10-	0	0	0	0	?	5·17	1 23	2 60	17	+ 01	·0	W 12	SW 4	W	3 127	2 99	16	00	·· 0	N b E 5	3 59	833	16	·· 0	195	3 47	862
		,				?	5 13	,	2 59	16	00	0	W 7	·· 0	H	3 189	3 06	16	00	· 0	· 0	3 60	850	16	·· 0	200	3 51	872
	20-10-„	0	0	0	0	?	5·08	1 22	2·60	16	− 01	·0	0	· 0	H	3 166	3·04	16	+ 01	· 0	· 0	3 67	828	16	·· 0	165	3 19	953
	„ ,	„	,	„	,	?	5 12	„	2 56	13	− 01	·0	· 0	·· 0	W	3 035	2 95	14	− 02	· 0	· 0	3 63	813	15	·· 0	160	3 14	939
δ Range		0	0	0	0	?	10	01	14	12	··	0	·	·· ·		287	20	11	··	·· ·	·· ·	·16	076	10	·	050	45	155
ν Means of δ,		0	0	0	0	?	5·11	1 23	2 62	6 18	·	157 0	WSW 2			3 194	3 05	6 19	··	N b E ?		3 60	849	6 19	Calm	171	3·25	943
	10-10-76	0	0	0	214	?	4·88	97	1 30	5 78	+ 03	154 7	NW 6	· 0	P	2 485	2 60	5·78	− 01	·· 0	· 0	3 02	861	5 78	·· 0	170	3 14	828
	,	„	„		„	?	4 91	94	,	75	+ 02	7	· 0	NW 6	W	2 492	2 62	74	00	· 0	·· 0	2 97	882	74	·· 0	180	3 21	816
	1 10-„	0	0	0	214	?	4·63	77	1 2	·69	− ·03	7	·· 0	E 14	P	2 278	2 42	69	00	·· 0	·· 0	2 80	864	69	·· 0	140	2 82	858
	,	,	,	,	,	?	4·67	73	„	65	00	7	· 0	· 0	W	2 228	2 38	65	00	·· 0	· 0	2 87	829	65	·· 0	155	3 00	793
		0	0	0	0	?	28	24	10	13	·	0	· ·	·· ·		264	24	13	··	· ··	· ·	22	053	·13	·· ·	040	39	065
		0	0	0	214	?	4 77	·85	1 25	5 72	·	154 7	NE b N 1			2,371	2 51	5 72	··	Calm		2 92	859	5 72	Calm.	161	3 04	824

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXIV.

SOLANI EMBANKMENT MAIN SITE.

	1	2								3										4								5					
		CONTROL					FALL of Water Surface			ROD-VELOCITY RESULTS										CENTRAL SURFACE VELOCITY RESULTS								SURFACE SLOPE RESULTS.					
		Headworks Dhenauri			Tail Asafnagar								WIND From		WIND To							WIND. From		WIND. To					WIND.				
Serial No.	DATE 1876-77 73	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries.	Average Obstruction	Upper 4 miles.	1 mile below Site	Lower 4½ miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	CUBIC DISCHARGE in cub feet per sec	MEAN VELOCITY	Hyd. Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	CENTRAL SURFACE VELOCITY [Mean of 48 trials]	Ratio V — v_0	Hyd Mean Depth	Direction	Velocity	Surface Slope (Left Bank)	Value of $100\sqrt{RS}$	Ratio V — w
					Q	k	F_1	F_2	F_3	R		b						D	V	R						v_0	c	R			s	w	c
165	9·10 76	0	0	0	172	?	4 87	88	1 35	5 39	– 02	152 3	..	0	E	12	P	2,100	2 40	5 40	– 01	..	0	..	0	2 81	854	5 40	..	0	165	2 89	·830
167	7 10 76	0	0	0	137	?	4 65	75	1 30	5 05	– 02	152 3	..	0	NE	5	P	1 686	2 06	5 06	00	..	0	..	0	2 36	873	5 06	..	0	205	3 22	840
	14 2 77	0	0	0	16	·50	4 70	1 05	1 70	00	·00	151 2	..	0	S	10	W	1,759	2 20	00	·00	..	0	..	0	2 36	932	00	..	0	185	3 04	·712
δ Range		0	0	0	121	?	05	30	40	05	.	1 1	..	..	..	..	.	73	14	06	..	..	..	..	..	00	059	06	..	.	020	·18	072
v Means of 2		0	0	0	77	? 50	4 68	90	1 50	5·03	..	151 8	SEbS 2				.	1,723	2 13	5 03	..	Calm				2 36	903	5 03	Calm		195	3 13	676
169	6-10 76	0	0	0	59	?	4 67	93	1 00	4 84	00	150 0	..	0	..	0	P	1,469	1 91	4 81	00	..	0	..	0	2 00	955	4 84	..	0	200	3 11	·614
	5 10 ,,	0	0	0	60	?	4 71	1 49	0 40	81	– 01	0	..	0	..	0	W	1,420	1 86	81	+·01	..	0	..	0	2 06	903	82	..	0	200	3 11	599
δ Range		0	0	0	1	?	04	56	60	03	..	0	..	..	..	..		49	05	03	..	..	..	..	..	06	·052	02	..	..	000	·00	015
v Means of 2		0	0	0	60	?	4 69	1 21	·70	4 83	..	150 0	Calm					1,445	1 89	4 83	..	Calm				2 03	929	4 83	Calm		200	3 11	607
170	25 9-76	0	0	0	136	?	4 40	70	·60	4 72	– 06	150 0	..	0	..	0	H	1,152	1 54	4 75	+ 01	V	1	..	0	1·82	846	4 76	..	0	165	2 80	·550
171	31-10-77	0	0	0	263	74 30	3 66	24	10	4 76	+ 01	150 0	S	4	S	17	G	704 9	·93	4 76	+ 01	SE	5	S	4	·92	1 011	4 76	SE	5	038	1·35	689

173.	2 10 7	0	0	8	232	2 08	4 34	41	10	3 88	− 01	150 0	·	0	E	11	R	85° 7	1 40		·		·	·	·	?	?	3·89	·	0	003	1 90	737
	8-10 „	0	0	8	232	2 08	4 24	41	10	88	·00	·0		0	SW	17	R	828 7	1 36	3 88	00		0		0	1 53	885	88	·	0	050	1 87	727
	3-10 „	0	0	8	232	2 08	4 31	39	10	·86	− 02	0	E	6	E	9	P	794 4	1 3	87	00		0	E	0	1 5[illegible]	84	87	·	0	088	1 85	708
	4 10 „	0	0	8	232	2 08	4 34	41	05	84	00	·0	E	8	E	12	P	820 7	1 36	85	− 01		0	E	8	1 54	883	85	··	0	083	1 79	760
	7-10 „	0	0	8	232	2 08	4 24	41	10	84	− 02	0	·	0	N	8	P	806 1	1 34	85	00	··	0		0	1 52	882	85	··	0	085	1 81	740
δ Range		0	0	0	0	00	10	02	05	04		0	·		·			58 3	09	? 03		··	·	··	·	? 04	? 049	04		·	010	11	052
ν Means of 5,		0	0	8	232	2 08	4 29	41	09	3 86	·	150 0	E&S 3				·	820 5	1 35	?3 86			? E 2			?1 54	? 874	3 87	Calm		088	1 84	734
174	20-9 76	0	0	0	106	?	4 50	31	·60	4 20	− 27	150 0	··	0	··	0	W	887 6	1 34	4 33	+ 02	··	0		0	1 52	882	4 34	··	0	125	2 33	575
175	4 10 76	0	0	0	0	?	3 06	1 14	1 40	4 05	+ 05	150 0		0	··	0	N	1,155	1 82	4 03	00	··	0	·	0	1 86	978	4·03	··	0	215	2 94	618
176	20 9 76	3	0	8	109	2 09	5 00	70	30	3 28	00	150·0	E	8	E	18	P	842 7	1 65		··		·		·	?	?	3 28	E	8	?323	?3 26	? 300
	21 9 „	0	0	8	09	1 43	5 06	69	30	27	00	·0	·	0	NW	5	R	837 1	1 6	3 20	00	NW	5	··	0	1 79	·022	27	··	0	100	2 29	721
δ Range,		3	0	0	10	66	06	01	·00	01	·	·0	·· ·		·· ··		·	3 6	00	?	·	··	··	·	·	?	?	01	··	··	?103	? 03	? 215
ν Means of 2		4½	0	8	104	1 76	5 03	·70	30	3 28	··	150 0	E&N 6				··	839 9	1 65	3 26	··	? NW 3				?1 79	? 022	3 28	E 4		?242	?2 78	? 613
177	27 9 76	0	0	0	0	?	4 94	1·01	1 35	3 76	− ·04	150 0	··	0	E	10	N	866 3	1 50	3 72	+ 01	··	0	··	0	1 61	932	3 73	··	0	200	2 73	549
	29 9 „	0	0	0	0	?	5 03	1 17	1 03	61	+ 10	0	NE	4	NE	4	N	831 3	1 51	57	00	E	4	NE	4	1 54	981	57	E	1	195	2 64	572
	28 9 „	0	0	0	0	?	5 05	1·00	1 13	55	− 03	0	E	12	E	27	W	788 8	1 42	·57	00	··	0	··	0	1 50	947	57	··	0	185	2 51	558
δ Range,		0	0	0	0	?	11	17	32	15	·	0	·· ·		·· ·			77 7	09	15	·	··	·	··	··	·11	049	·16	··	·	015	16	023
ν Means of 3,		0	0	0	0	?	5 01	1 06	1 17	3 62	··	150 0	E&N 9					835 5	1 48	3 62	··	NE 1				1 55	933	3·62	E 1		193	2 65	558
179	3 10 76	0	0	0	0	?	5 18	10·	90	3 11	00	150 0	··	0	··	0	N	583·7	1 21	3 11	00	··	0	··	0	1 26	961	3 11	··	0	180	2 37	511
180	19 9 76	0	0	0	17	1 24	5 34	50	10	2 28	+ 03	150 0	··	0	··	0	P	315 0	90	2 24	− 01	··	0	·	0	93	918	2 25	··	0	150	1 84	489
	18 9 „	0	0	9	21	1 24	5 69	·1	10	24	00	0	NW	1	··	0	R	286 7	84	21	00	··	0	E	1	83	1 012	24	NW	1	145	1 80	467
δ Range,		0	0	0	4	00	35	35	00	04	··	0	·· ··		·· ·		·	25 3	06	00	·	··		·· ··		15	094	01	··	·	005	04	022
ν Means of 2		0	0	9	19	1 24	5 72	30	10	2 26	··	150 0	NW 1				·	300 9	87	2 24	··	E 1				91	965	2 25	NW 1		148	1 82	478
	12 7 76	13	0	10	0	67	7 98	50	?·06	1 60	+ 07	150·0	·	0	S	11	R	114 1	44	No Observations								1 73	S	11	030	1 25	352

TABLE LXV

CENTRAL SURFACE AND MEAN VELOCITIES

Fifteenth Mile Old Site

	1	2								3										4								5					
		Control					Fall of Water-surface			Rod Velocity Results										Central Surface Velocity Results								Surface Slope Results					
		Dam works			Tail Ave rage								Wind									Wind							Wind				
													From		To							From		To									
Serial No.	Date 1878	Gates open in Dam	Ogees open in Dam	Gates closed in Regulators	Withdrawn by Distributaries Q	Average Obstruction k	Upper 2 miles F_1	3 miles below S F	Lower 4½ miles	Hydraulic Mean Depth	Variation of water level	Surface Breadth b	Direction	Velocity	Direction	Velocity	Time kept in air	Good Range b feet per sec.	Mean Velocity	Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Vel. Mean of 3 trial v	$V - v_0$	Mean Depth	Direction	Velocity	Surface Slope (Left Bank) s	Value of 100√RS w	Ratio V — w c
191	29 5 78	0	0	0	123	00	2 98	3			02	174 9	NW	1	N1	3	T	7			00	NW	1	NW	1	4 91			NW	1	240	4 77	879
192	21-4 78	0	0	0	0	00	2 24	3			01	174 9	N	8		0	T	5			00	N	8	N	1	4 60			N	3	238	4 54	880
	23-4	0	0	0	0	00	2 2[illegible]	3			01	9		0		0	E	6			00		0		0	4 58				0	228	4 44	937
	10 4	0	0	0	115	00	2 26	3			01	9		0		0	T	6			00		0		0	4 71				0	253	4 67	857
	20 4	0	0	0	50	00	2 26	3			02	9		0		0	R	6			00		0		0	4 57				0	223	4 39	911
	30 4	0	0	0	50	00	2 20	3			+ 02	9		0		0	T	6			00		0		0	4 54				0	220	4 35	910
	1-5	0	0	0	50	00	2 20	3			01	9		0		0	R	6			00	N	3		0	4 6				0	225	4 40	911
	Range	0	0	0	115	00	05					0														17					033	32	107
	Means of 6	0	0	0	44	00	2 26	3				174 9	N1					6				N 1				4 60			N1		231	4 47	893
193	8 4 78	0	0	0	126	00	2 26	3			+ 12	174 9		0		0	R	5			+ 03		0		0	4 57				0	228	4 37	890
	4 4	0	0	0	113	00	2 31	3			00	9		0		0	T	5			00		0		0	4 44				0	223	4 33	891
	20-3	0	0	0	0	00	2 34	3			00	9	N	8	NW	7	B				00	S	9	V	b	4 53			N	8	230	4 38	8 0
	Range	0	0	0	126	00	08					0														13					007	05	012
	Means of 3	0	0	0	80	·00	2 30	3				174 9	NNW 2									S 2				4 51			N 3		227	4 36	887
194	15 4 78	0	0	0	0	·00	2 27	3			− 03	174 9	SW	4		0	R				01		0		0	4 55			SW	4	228	4 31	912
	16 4	0	0	0	0	00	2 20	3			+ 01	9		0		0	T				00		0		0	4 66				0	233	4 30	912
	Range	0	0	0	0	00	01					0														11					005	01	000
	Means of 2	0	0	0	0	00	2 27					174 9	SW 1									Calm				4 61			SW 2		261	4 31	912
195	25 5 78	0	0	0	62	00	2 00				+ 15	171 3		0	V	1	T				00		0		0	4 21			No Observations				

FIFTEENTH MILE NEW SITE

[The Surface-Slope (S) is the mean of measurements on both banks (given in Table XLIX), the state of the Wind is given for each]

	1	2								3										4								5					
		CONTROL					FALL of Water Surface			ROD VELOCITY RESULTS										CENTRAL SURFACE VELOCITY RESULTS								SURFACE SLOPE RESULTS					
		Headworks [illegible]		Tail [illegible]									WIND									WIND							WIND				
													From		To							From		To									
Serial No.	DATE 1878 79	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	Average Obstruction k	Upper 2 miles F_1	3 miles below Site F_2	Lower 4½ miles F_3	Hyd Mean Depth R	Variation of water level	Surface-Breadth b	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	CUBIC DISCHARGE in cub. feet per sec. D	MEAN VELOCITY V	Hyd Mean Depth R	Variation of water level	Direction	Velocity	Direction	Velocity	CENTRAL SURFACE VELOCITY [Mean of 48 trials] v_0	Ratio $V - v_0$ c	Hyd Mean Depth R	Direction	Velocity	Surface-Slope [Both Banks] s	Value of $100\sqrt{RS}$ w	Ratio $V - w$ c
196.	18 12 78	0	0	0	268	00	2 28	3 60	5 43	8 71	− 03	186 0	W	8	.	0	R	6 921	4 14	8 68	00	SW	4	..	0	4 69	883	8 72	W ..	8 0	?215	?4 33	? 956
	19 12 „	0	0	0	268	00	2 21	3 64	5·45	68	+ 01	185 9	..	0	\	l	S	6,841	4 11	68	00	V	l	..	0	4 61	892	68	.. V	0 l	226	4 45	·928
	20·12 „	0	0	0	268	00	2 28	3·62	5 23	·63	·00	7	..	0	V	l	R	6,806	4 12	64	− 01	S	9	W	6	4 77	864	63	. V	0 l	222	4 38	941
δ Range		0	0	0	0	00	·07	·07	·22	08	..	3	..	.	..	.		115	03	04	..	..	.	..	..	16	·028	09	..	..	?011	? 10	? 028
Means of 3		0	0	0	268	00	2 26	3·65	5 37	8 67	..	185 9	W 1					6 657	4 12	8 67	..	SW 1				4 60	880	8 68	W 1		?221	?4 38	? 942
197	15 4 79	0	0	?	115	00	2 19	3·66	5 20	8 35	+ 10	184 2	V	l	SW	14	S	6,287	3 98	8 37	+ 02	V	l	SW	13	4 52	881	8 35	V SW	l 14	220	4 29	928

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXVI.

Bhira Site.

[The surface-Slope (S) is the mean of measurements on both banks (given in Table LXI); the state of the Wind is given for each.]

Serial No.	1	2				3						
		Control		Fall of Water		Rod Velocity Results						
		Tail of Reach							Wind			
									From		To	
	Date, 1879	Withdrawn by Distributaries	Average Obstruction	Upper 1 mile	Lower 4 miles	Hyd Mean Depth	Variation of water-level	Surface-Breadth	Direction	Velocity	Direction	Velocity
		Q	k	F_1	F_2	D		b				
201.	27 3	27	00	72	4·05	9 10	− 07	188 5	.	0		0
	9-1	243	00	?	?	·07	00	5	..	0		0
	11 1	257	00	?	?	8 98	+ 03	4	s	6	.	0
	10-1	257	00	?	?	98	− 02	4	s	6	.	0
	17-3	62	00	67	3·00	93	− 02	3	N	1	N	1
δ Range		230	00	? 05	? 15	26	..	2	..	..	.	..
μ Means of 5		165	·00	? 70	?3·08	9·02	..	188 4	S 1			
Series 202	21 1	209	00	?	?	8 75	·00	188·0	..	0	.	0
	22 1	221	00	?	?	74	+ 02	0	N	3	NW	4
	23 1	221	00	?	?	·68	00	187 9	..	0	..	0
		„	„	?	?	71	00	186 0	NW	11	NNW	5
	18-3	143	00	66	3 81	80	00	2	..	0		0
	24 2	0	00	98	3 55	68	− 05	0		0	s	1
	17 1	298	00	?	?	63	+ 03	0	N	7	NW	3
δ Range		298	00	? 32	?·22	23	..	3	..	.	..	.
μ Means of 7		168	·00	? 82	?3·70	8 72	..	188·0	NNW 2			

Serial No.	4								5								6
	Central Surface-Velocity Results								Surface-Slope Results								
			Wind							Wind							
			From		To					1st Slope		2nd Slope					
	Hyd Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of all trials)	Ratio V − v_0	Hyd Mean Depth	Direction	Velocity	Direction	Velocity	Surface-Slope (both Banks)	Value of $100\sqrt{S}$	Ratio V − w	Silt in grains per cub. ft.
	D						v_0	c	D					S	w	C	σ
201.	18	− 03	..	0	..	0	3 59	·830	9 10	..	0	..	0	180	4 07	·737	86
		.	.	..	..	.	?	?	03	..	0	..	0	200	4 25	·774	71
	06	+ 01	s	1	..	0	3 68	·889	8·98	s	8	.	0	203	4 27	·760	93
	07	00	s	6	..	0	3 73	·874	·08	s	6	..	0	193	4 16	·781	?
	01	00	N	1	N	1	3 60	·830	93	N	1	N	1	178	3 99	·767	1025
δ Range	24	..	..	..	..	..	? 14	? 053	20	..	.	..	.	025	28	047	?054
μ Means of 5	·02	..	? S 1				?3 67	? 853	9 02	S 1				191	4 15	·763	?219
Series 202	·77	00	..	0	..	0	3 71	·811	8 75	..	0	..	0	205	4 34	·738	668
	75	00	N	9	N	9	3 59	·866	74	N	8	NW	4	205	4 23	·735	63
	65	00	.	0	W	9	3 79	·826	68	..	0	N b W	11	208	4 25	·730	129
	.	„	„	„	„	„	„	·842	71	„	.	„	.	„	4 26	·745	„
	80	00	..	0	.	0	3 68	·822	80	..	0	..	0	180	3 99	·767	73
	68	00	..	0	s	1	3 53	·858	68	..	0	s	1	182	3 99	·755	161
	66	+ 03	NW	3	NW	8	3 78	·852	63	N	7	NW	3	210	4 26	·756	2981
δ Range	20	..	..	..	..	.	28	040	23	..	..	..	..	030	27	032	2918
μ Means of 7	72	..	NW 3				3·70	·840	8 72	N b W 3				200	4 17	·745	600

Series 203.	25-3	38	00	0 76	3 61	8 64		ealter al	.. 0	S 11	P	5 193	3	00	S 1	S 8	3 33	922	8·64	. 0	S 11	168	3 81	600	81
	20-3	150	00	0 60	3 67	56	−		. 0	.. 0	P	5 174	3	− 02	. 0	. 0	3 43	901	56	.. 0	. 0	188	4 01	771	124
	25 1	284	00	?	?	52			N 1	. 0	P	5 311	3	00	0	N 1	3 60	889	52	N 1	.. 0	218	4 31	742	108
	25 2	0	00	1 17	3 40	52	−		. 0	N 1	A	5 093	3	− 01	N 1	N 1	3 64	841	52	. 0	N 1	185	3 97	771	103
				1 21	3 30	48	−		N 1	N 7	P	4 984	3					827	48				3 96	770	
	16 1	298	00	?	?	·42	+		S 5	. 0	P	5 235	3	00	S 8	0	3 57	836	42	S 5	. 0	200	4 10	780	342
	15 3	93	00	1 03	3 64	41	+		. 0	N 1	P	5 103	3	+ 05	.. 0	.. 0	3 68	815	41	.. 0	N 1	188	3 98	781	90
	14 3	134	00	0 58	3 35	37	−		0	. 0	A	4 753	2	..	. .	. .	?	?	37	0	.. 0	?175	?3 83	? 760	186
	27·1	280	00	0 96	3 51	·31			S 1	.. 0	A	5,142	3	+ 02	.. 0	.. 0	3 57	888	31	S 1	.. 0	205	4 13	768	138
Range		298	00	? 63	? 31	33	..		.. ..	.. .		558		..	.. ..	. .	? 35	? 095	33	.. ..	. ..	?050	? 50	? 084	049
Means of 9		142	00	? 90	?3 51	8·47	..		S 1			5,112	3	..	? S 1		?3 50	? 876	8 47	S 1		?191	?4 01	? 771	430
Series 204.	21 3	140	00	0 73	3 34	8 28	−		.. 0	. 0	P	4 815	2	00	.. 0	.. 0	3 35	800	8 28	.. 0	.. 0	180	3 86	774	55
	13-3	171	00	1 15	3 59	27	+		S 1	.. 0	P	4 900	3	..	.. .	.. .	?	?	27	S 1	. 0	203	4 10	740	134
	27 2	0	00	0 75	3 22	28	−		.. 0	.. 0	A	4,762	2	− 01	.. 0	.. 0	3 44	860	28	.. 0	.. 0	188	3 95	745	144
				0 77	3 20	20	−		.. 0	N 1	P	4,790	2	"	"	"	"	860	20	"	"		3 94	760	"
	22 3	150	00	0·75	3 37	20	−		.. 0	.. 0	A	4 781	2	·00	.. 0	.. 0	3 35	887	20	. 0	.. 0	188	3 94	754	666
	24-3	51	00	0·71	3 30	25	−		0	.. 0	P	4 725	2	·00	.. 0	.. 0	3 38	870	25	.. 0	.. 0	185	3 91	762	298
	18-2	117	·19	0 63	3 11	24	−		N 1	.. 0	P	4 911	3	00	. 0	N 1	3 46	890	24	N 1	.. 0	195	4 01	768	859
	28-2	0	00	0 53	3·24	21	−		.. 0	N 1	A	4 786	3	00	N 1	N 1	3 37	890	21	0	N 1	255	4 58	655	84
	17 2	127	28	0 36	3 11	21	+		N 1	N 1	A	4 718	2	+ 01	N 1	N 1	3 58	824	21	N 1	N 1	205	4 10	720	98
	20 2	155	28	1 07	3 10	20	−		.. 0	. 0	A	4 777	2	00	.. 0	.. 0	3 61	828	20	.. 0	.. 0	193	3 98	751	105
	21 2	153	28	0 84	3 03	14			.. 0	N 1	P	4 763	3	00	.. 0	.. 0	3 50	800	14	0	N 1	190	3 93	760	293
	22 2	174	28	0·95	3 02	13			.. 0	.. 0	A	4 830	3	00	N 1	N 1	3 51	809	13	.. 0	.. 0	190	3 93	770	59
	6 2	217	·00	0 76	3 32	11			.. 0	N 1	A	4,601	3	00	.. 0	N 1	3 62	840	11	.. 0	N 1	203	4 06	740	60
	28·1	280	00	1 02	3 25	·08	+		.. 0	.. 0	P	4,931	3	00	.. 0	.. 0	3 47	905	08	.. 0	.. 0	215	4 17	755	1258
Range		280	09	83	56	20	..		.. ..	.. ..	..	223		--	.. ..	.. ..	? 27	? 081	20	.. ..	.. .	075	72	121	1203
Means of 14		124	·09	79	3 23	8 21	..		N 1		..	4,810	3	..	? N 1		?3 47	? 808	8 21	N 1		198	4 03	747	304
Series 205	7 2	257	00	0·79	3 28	8 08	−		.. 0	N 1	P	4,791	3	− ·02	.. 0	.. 0	3 60	847	8·03	.. 0	N 1	203	4 05	753	241
	8 2	247	00	0 94	3 23	03			N 1	.. 0	A	4 826	3	00	.. 0	.. 0	3 57	866	·03	N 1	.. 0	200	4·01	771	96
	30 1	263	00	1·03	3 19	7 99			.. 0	.. 0	A	4,745	3	00	.. 0	.. 0	3 53	867	7 99	.. 0	.. 0	218	4 17	734	66
	10-2	247	47	0 84	2 88	96			.. 0	.. 0	P	4 724	3	·00	.. 0	.. 0	3 44	887	96	.. 0	.. 0	200	3 99	764	108
	31·1	255	·00	0 95	3 12	88			NNW 7	NW 5	P	4 718	3	00	NW 6	N 9	3 58	860	88	NNW 7	N 5	220	4 16	740	139
	4 2	255	·00	0·68	3 10	80			.. 0	.. 0	P	4,791	3	00	.. 0	.. 0	3 46	890	80	.. 0	.. 0	208	4 03	·764	561
Range		16	47	33	40	28	..	2	.. ..	.. .	..	108		..	.. ..	.. ..	·16	·043	28	.. .	.. ..	020	18	037	495
Means of 6		254	08	87	3 15	7 96	..	187 3	NW b N 1		.	4,766	3	..	NNW 1		3 53	870	7 96	NW b N 1		208	4 07	754	202

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXVII.

Belra Site

[The Upper Sub-Reach is about [illegible] mile long and the Lower about [illegible] miles]

[The Surface-Slope (S) is the mean of measurements on both banks (given in Tables L LI) the state of the Wind is given for each]

Serial No.	1	2				3									4								5								6
		Control		Fall of Water Surface		Rod-Velocity Results									Central Surface Velocity Results								Surface-Slope Results								Silt
		Tail of Reach							Wind								Wind							Wind							
									From		To						From		To					1st Slope		2nd Slope					
	Date 18 9	With drawn by Distributaries Q	Average Obstruction λ	Upper Sub-Reach F_1	Lower Sub-Reach F_2	Hyd Mean Depth R	Variation of water level	Surface Breadth b	Direction	Velocity	Direction	Velocity	[illegible] J	[illegible]	Hyd Mean Depth R	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of 15 trials) v_0	Ratio $V - v_0$ c	Hyd Mean Depth R	Direction	Veloc ty	Direct on	Velocity	Surface Slope Banks s	$f100\sqrt{RS}$	Ratio $V - u$ C	In grs as per cub ft σ
Series 206.	8·2	255	00	0·84	2·88	7·77	00	187·0		0		0			7·77	00	.	0	.	0	3·43	880	7·77	.	0		0	2	.	736	99
	7·3	147	00	0·72	8·05	70	− 03	186·9		0	.	0			71	+ 01	.	0		0	3·28	875	70		0	.	0	2		714	158
	8·3	147	00	0·74	2·63	69	00	9	..	0	..	0			68	00	.	0		0	3·29	875	69	..	0	..	0	1		736	5233
	6·3	108	00	0·75	3·07	68	00	9	N	1	.	0			68	00		0	.	0	3·41	839	68	N	1	..	0	2		725	58
	3·3	156	00	0·85	2·87	63	+ 02	9	N	6	N	5			64	00	N	5	N & W	7	3·26	856	63	N	6	N	5	1		721	81
	11·2	247	·56	1·03	2·40	62	− 05	9	..	0	..	0			61	+ 03	.	0	..	0	3·32	904	62	.	0	..	0	?1		?773	818
	4·3	151	00	0·74	2·03	60	00	8	N	1	N	1			52	− 02	NW	8	NW	4	3·47	866	60	N	1	N	1	2		746	127
	13·2	217	56	0·84	2·43	57	00	8	.	0	N	1			57	00	N	1	.	0	3·52	869	57	..	0	N	1	?1		?801	99
	14·2	101	56	0·82	2·35	50	00	7	.	0	.	0			50	00	..	0	..	0	3·38	870	50	..	0	..	0	?1		?770	171
	15·2	101	56	0·74	2·35	48	00	7	E	5		0			48	00	SE	8	.	0	3·37	855	48	E	5		0	?1		?758	219
	11·3	147	00	0·69	2·86	47	− 05	7	.	0	N	19			46	− 02		0	N	1	3·48	830	47	..	0	N	19	1		751	48
	10·3	147	00	0·72	2·85	46	− 02	7	..	0	..	0			46	− 02	N	1	..	0	3·40	829	46		0	..	0	1		752	123
a Range		108	56	34	70	31	.	3	..	..	..	.			31	.	..	..	..	.	26	075	31	..	..	..	.	?0		?087	5185
b Means of 12.		183	19	79	2·74	7·60	..	186·8	N b E 1						7·59	.	N & W 1				3·39	862	7·60	N b E 1				?20		?749	601

CENTRAL SURFACE AND MEAN VELOCITIES

JAOLI SITE

(The Type S [illegible] [illegible] [illegible] [illegible] and [illegible] Lower [illegible] [illegible]

(The Surface-Slope S) is [illegible] [illegible] measurements on both banks [illegible] Tables [illegible] [illegible] [illegible] [illegible] [illegible] on for [illegible]

Series 211	9 1	59	·00	3		86	+ 01	19 8	V	1	V	1	S	4	00	V	1		0	3 48	879	7 80	V	1	V	1	7178	3 74	7 818	No Observat ons.
	7 1	59	7 00	3		86	− 05	8	V	9		0	S	4	·00	SW	4	S	5	3 47	8[illegible]6	80	W	3		0	178	3 4	791	
		59	7 00	3		86	− 02	8	W	3	V	1	R	4	00	SW	6	V	1	3 46	847	80						3 74	783	
	8 1	59	7 00	·3		83	00	8	N	4	V	1	R	4	00	N	7	W	3	3 53	837	83	N	4	V	1	183	3 79	784	
	17·3	44	00	3		89	− 04	6	NW	10	W	20	R	4	− 02	W	17	N V	8	3 38	849	82	NW	10	W	20			831	
	27 3	0	00	5		·97	− 12	9		0		0	S	4	− 02		0	V	1	3 44	863	77		0		0			816	
	10 1	59	·00	3		75	00	7	N	6	NE	7	R	4	+ 01	N	8	N	2	3 46	864	75	N	6	NE	7			804	
	11 1	59	00	4		73	+ 09	7	E	4	V	1	S	4	00	N	4	E	5	3 39	900	73	E	4	V	1			80	
	6 1	75	7 00	3		·70	00	7	S	5	W	3	S	4	00	S	3	V	1	3 37	8[illegible]	70	S	5	W	3			776	
δ Range		75	7 00	2		27		3												25	063	27							7 058	
Mean of 9		53	7 00	·3		82		19 8	NW b W 2					4		WNW 2				3 43	861	7 82	NW b W 2				7		7 802	
Series 212	18·3	90	00	3		64	− 04	192 4	W	1	SW	9	R	4	− 02	S	8	W	10	3 16	911	7 64	W	1	SW	9			847	No Obser ations
	24 [illegible]	0	00	3		·51	− 03	3		0	S	13	S	4	·00		0		0	3 30	879	51		0	S	13			871	
	21 1	53	00	3		40	04	3		0	S	4	S	4	00	S	1	S	1	3 28	916	40		0	S	4			840	
	2[illegible] 1	53	00	3		39	− 02	2	NW	7	W	17	R	4	− 02	W	17	NW	17	3 40	89	39	NW	7	W	17			8[illegible]	
	2[illegible] 2	0	00	2		·38	00	2		0	N	8	R	4	00	N	6	N	7	3 40	830	38		0	NW	6			862	
	23 1	59	00	3		36	00	2	NW	4	W	2[illegible]	S	4	00	W	6	W	14	3 36	878	36	NW	4	W	23			831	
δ Range		90	00	0		28		2												·24	088	28							040	
Mean of 6		43	·00	3		46		19 3	W b S 5					4		W b N 5				3 32	880	7 46	W b S 5						853	
Series 213	15·3	44	00	29	4 9	7 40	+ 20	192 1	SW	5	W	3	R	4	+ 04	W	7	N	8	3 43	822	7 40	SW	5	W	3			873	No Observat ons
	2 2	0	00	30	5 12	36	− 02	1	N	6	NW	6	S	4	00	N	8	N	7	3 40	844	30		0	NW	6			878	
	2[illegible] 3	100	00	31	5·08	28	+ 02	1	E	17	E	17	S	4	00	E	20	E	17	3 25	89[illegible]	28	E	17	E	17			869	
	17 1	63	00	3[illegible]	4 9[illegible]	19	− 02	1	W	11	W	14	R	4	00	NW	8	W	7	3 40	865	19	W	11	W	14	7		7 872	
	18·[illegible]	80	1 00	·26	4 28	17	00	191 9	N	4	N	8	S	4	00	N	4		1	3 42	8[illegible]	17	N	4	N	8			904	
	17 2	20	1 00	23	4 16	15	+ 02	9	N	6	W	4	R	3	+ 04	S	3	W	6	3 33	834	15	N	6	W	4			871	
	16 1	59	00	32	5 00	02	− 04	9		0	V	1	S	4	− 02		0	V	1	3 27	911	09		0	V	1			876	
δ Range		100	1 00	12	96	38		2												18	089	38					7		7 035	
Mean of 7		52	29	29	4 80	7 22		19 0	N b W 2					4	..	NNE 2				3 36	857	7 92	N b W 1				7		7 878	

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXVIII.

Jaoli Site

(The Surface Slope (S) is the mean of measurements on both banks (given in Tables LII. VIII.; the state of the Wind is given for each)

Serial No.	1	2				3								:.		4									5						
	Date 1879	Control Tail of Reach		Fall of Water Surface		Rod Velocity Results										Central Surface Velocity Result									Surface Slope Results						
									Wind									Wind							Wind						
									From		To							From		To					1st Slope		2nd Slope				
		Withdrawn by Distributaries	Average Obstruction	Upper 1 mile	Lower 5 miles	Hyd Mean Depth	Variation of water level	Surface-Breadth	Direction	Velocity	Direction	Velocity			Mean Velocity	Hyd Mean Depth	Variation of water level	Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of ...)	$\frac{V}{v_0}$	Direction	Velocity	Direction	Velocity	Surface-Slope (both Banks)	of $100\sqrt{RS}$	Ratio $V-$
		Q	δ	F_1	F_2	D		b							V	R						v_0								C
Series 214	20-3	80	00	28	4·01	7 14	− 00	101 8	W	8	W	11			2 82	7 11	+ 02	W	7	W	5	3 17		W	8	W	11			852
	13-3	41	00	28	4·80	·00	+ 32	7		0	N	11			2 81	·05	+ 12	•	0	•	0	3 31			0	N	11			842
	27 2	0	00	21	4 78	06	− 01	8	W	10	NW	13			2 86	85	+ 02	W	25	W	11	3 39		W	10	NW	13			880
		0	00	21	4 25	·06	00	8	W	10	NW	20			2 79															883
	20 2	30	00	23	4 8	05	00	8	NW	16	W	7			2 74	05	00	NW	6	W	14	3 25		NW	16	W	7			907
	25-1	63	00	33	4 76	·02	00	8	W	6	W	12			2 89	07	00	NW	6	W	6	3 18		N	6	N	12			898
	23	0	00	25	4 81	02	− 01	·7	NW	10	W	33			2 77	01	00	SW	5	SW	7	3 22		NW	10	W	83			874
	27 1	03	00	32	4 8	6 98	− 01	7	E	6	E	5			2 87	6 98	− 04	E	9	E	8	3 28		E	6	E	5			875
δ Range		50	00	09	66	16	•	1	•	•					15	13	•	•	•	•		22		••	•	•				065
ν Means of 8		55	·00	28	4 70	7·05		101 8	WNW 9						2 81	7·01		W 7				3 27		WNW 9						878
Series 215	21 3	00	00	27	4 70	6 97	− 00	101 6	W	8	W	14	s	3 701	2 79	6 90	− 02	W	13	W	17	3 17		W	8	W	14			864
	1 2	20	00	·31	4 65	90	− 06	6		0	N	5	s	3 766	2 76	90	00	NW	1	N	7	3 32			0	N	5			905
	1 3	90	00	[illegible]	4 8	89	+ 04	6	W	20	W	29	s	3 923	2 88	89	+ 02	W	10	W	20	3 22		W	20	W	29			903
	2 3	90	00	23	4 76	89	+ 07	·6	SW	8	SW	17	R	3 878	2 85	89	+ 02	SW	13	SW	13	3 09		SW	8	SW	17			893
	2	0	00	28	4 60	88	00	6	••	0	NW	1	R	3 758	2 76	88	00	NE	4	W	7	3 27		•	0	NW	1			926
	3 1	63	00	24	4 5	76	− 04	5		0	SW	6	s	3 646	2 73	76	00		0	S	2	3 16			0	SW	6			872
	8 2	0	1 00	23	3 80	76	00	4	SW	10	W	11	R	3 565	2 74	76	00	W	7	W	8	3 16		SW	10	W	11			887
	15 1	59	00	18	4·61	67	+ 05	5	S	7	V	4	R	3 787	2 95	67	+ 04	V	1	V	1	3 21		N	3	V	1			863
	10-2	0	1 00	23	3 5	62	− 01	4	•	0	N	3	s	3 617	2 77	62	− 02	N	5	N	8	3 26		••	0	N	3			926
	14 1	59	00	6	4 63	60	+ 03	4	W	8	W	10	R	3 757	2 80	61	+ 02	NW	10	NW	5	3 28		W	8	W	10			667
δ Range		00	1 00	23	1 05	32	•	2	•	•	••			358	27	29	•	•		•		23		••		•			•	072
ν Means of 10		45	·20	25	4 55	6 75		101 5	W b S 7					3 740	2 80	6 75		W b N 5				3 21		W b S 7						892

Series 216.	6 2	05	1 00	6 66	00	101 3	W 14	W 20	R	00	W 19	W 14	3 0.	001	6 66	W 14	W 20		883
	20·1	75	00	·59	00	·3	. 0	W 6	R	00	W 2	SW 7	3 19	890	·59	. 0	W 6		931
	7 2	0	1 00	57	00	3	W 9	NW 10	S	00	W 20	SW 16	3 21	801	57	W 9	NW 10		845
	4 2	05	1 00	55	00	2	N 3	S 4	S	00	.. 0	S 7	3 15	832	55	N 3	S 4		870
	7 3	0	00	51	+ 02	1	.. 0	NNW 5	S	+ 02	.. 0	. 0	3 20	850	51	. 0	NNW 5		892
	15 1	59	00	48	+ 06	·3	N 3	.. 0	S	00	.. 0	0	3 19	890	48	N 3	V 1	.	866
	8·3	0	·00	48	+ 10	1	.. 0	SW 8	R	+ 02	S 8	SW 7	3 07	860	48	.. 0	SW 8		880
	31 1	75	1 00	47	00	2	W 20	W 25	S	00	W 33	SW 20	3 04	885	47	W 20	W 25		876
	6 3	0	00	45	00	1	NW 11	W 10	R	00	W 10	W 7	3 14	854	45	NW 11	W 10	.	899
δ Range		05	1 00	21	..	2	. ..	.. .		..	.. .	.. ..	18	100	21	.. ..	.. .		086
ʋ Means of 8		44	44	6 53	.	101 2	W b N 7			..	WSW 9		3 14	863	6 53	W b N 7			·883
Series 217.	3 2	05	1 00	6 37	00	101·0	SW 11	SW 13	R	00	SW 11	SW 6	3 02	861	6 37	SW 11	SW 13	.	887
	14 2	0	1 00	36	00	100 9	V 1	N 3	R	00	V 1	V 1	3 18	830	36	V 1	N 3		901
	4 3	0	00	33	+ 04	101 0	SW 6	W 25	R	+ 02	NW 25	NW 20	3 17	833	33	SW 6	W 25		866
	11 2	0	1 00	34	− 06	100 3	E 4	SE 4	R	+ 02	. 0	S 6	3 12	840	34	E 4	SE 4		877
	13 2	0	1 00	·32	− 04	9	W 14	W 25	S	+ 02	W 20	W 20	3 03	861	32	W 14	W 25		882
	11 3	0	00	20	00	8	E 11	SE 7	R	00	.. 0	.. 0	3 04	868	20	E 11	SE 7		901
δ Range,		05	1 00	17	.	2	. .	.. .	..	..	.. ..	.. ..	·16	038	·17	.. ..	.. .		035
ʋ Means of 6,		16	67	6·32	..	100·0	WSW 6		..	..	W b N 7		3 09	850	6 32	WSW 6			886

CENTRAL SURFACE AND MEAN VELOCITIES

TABLE LXIX.

KAMHERA SITE

The Surface-Slope (S) is the mean of measurements on both banks (given in Tables LIV LV) the state of the Wind is given for each

	1	2				3										C		4						5							
		CONTROL		FALL of Water Surface		ROD VELOCITY RESULTS												SURFACE VELOCITY RESULTS						SURFACE SLOPE RESULTS							
		Fall of Tank							WIND									WIND							WIND						
									From		To							From		To					1st Slope		2nd Slope				
Serial No	Date, 187-	Withdrawn by Irrigation Q	Average Obstruction t	Upper 2½ miles F_1	Lower 8½ miles F_2	Hyd Mean Depth n	Variation of water level	Surface-Breadth b	Direction	Velocity	Direction	Velocity	Timekeeper's Initial	Cubic Discharge in each foot per sec. D	Mean Velocity V	Hyd Mean Depth I		Direction	Velocity	Direction	Velocity	Central Surface Velocity (Mean of 12 trials) v_0	Ratio $V \div v_0$ c	Hyd Mean Depth n	Direction	Velocity	Direction	Velocity	Surface-Slope (both banks) S	Value of $10^6 \sqrt{I}$ w	Ratio $V \div w$ c
221.	6 2	102	1 26	2 82	11 89	4 91	+ 03	63 6	NNW	18	NNW	18	cl	981 6	2 87	4	00	NNW	18	NNW	10	3 54	811	4 91	NNW	18	NNW	18	290	3 77	·761
	7 2	102	1 26	2 85	11 84	87	00	3	N	13	N	8	c	967 1	2 85		00	N	7	N	10	3 51	812	87	N	13	N	8	297	3 80	·750
	4 2	102	1 26	2 79	11 78	82	− 02	4	..	0	V	/	c	949 0	2 81		− 02	V	/	V	/	3 26	869	82	..	0	.	0	297	3 78	749
	3 2	99	1 20	2 87	11 64	74	− 02	5	NNW	12	NW	7	cl	945 8	2 88		00	NNW	15	NW	8	3 28	878	74	NNW	12	NW	7	298	3 76	766
	Range,	3	00	08	21	17	..	2	..	..	..	.		35 8	03		..	..	..	..	.	28	·067	·17	..	..	..	..	008	04	017
	Means of 4	101	1 20	2 83	11 80	4 84	..	63 5	NNW 9					960 6	2 86	4	..	NNW 9				3 40	842	4 84	NNW 9				295	3 78	757
Series 222.	20·3	80	1			·70	− 01	66 3	N	11	N	11	cl	96			00	N	7	NW	8	3 28	830	4 70	N	11	N	11			762
	31·1	95	1			62	+ 01	65 4	NNW	10	N	23	c	9			00	NNW	11	N	16	3 52	821	·62	NNW	19	N	23			·794
	30 1	08	1			58	00	3	.	0	NW	9	cl	8			00	V	/	NW	11	3 32	859	58	..	0	NW	9			783
	27·1	08	1			57	00	3	V	/	.	0	cl	8			00	..	0	..	0	3 33	850	57	V	/		0			794
	28·1	08	1			55	00	3	..	0	V	/	c	8			00	V	/	V	/	3 17	884	55	..	0	V	/			761
	2·1	09	1			54	00	·4	NNW	9	NNW	10	c	8			·00	NNW	9	NW	13	3 48	·810	54	NNW	9	NNW	10			·786
	4 1	92	1			47	00	0	..	0	.	0	c	8			00	..	0	V	/	3 26	86	47	..	0	V	/			775
	″	″				46	00	0	″	.	V	/	c	8			″	″	,	″	,	,	868	40	″	,	″	,			778
	3·1	02	1			40	·00	0	NNW	7	NNW	11	cl	8			− 01	NNW	11	NW	3	3 44	85	46	NNW	7	NNW	11			801
	9 1	94	1			44	− 02	64 9	.	0	..	0	cl	8			00	..	0	..	0	3 21	854	44	..	0	..	0			753
	10 1	94	1			43	− ·01	9	V	/	V	/	c	8			00	V	/	V	/	3 12	875	·43	V	/	V	/			740
	13 1	90	1			·42	00	65 0		0	.	0	cl	8	·42		00	..	0	..	0	3 22	860	42	..	0	..	0			765
	″	.				42	+ 02	1	..	0	V	/	c	8			″	..	.	..	″	.	860	·42	″	,	..	,			·770
	17·1	88	1			42	− ·02	·1	\	10	N	18	cl	8	41		00	N	18	N	19	3 52	810	42	N	10	N	21			808
	″	″				42	·00	0	\	19	N	21	c	8	″		″	″	″	″	.	″	810	·42	″	″	″	″			808
	Range	18				34	..	1 4	..	.	..	.	.			·34	..	..	..	..	..	40	074	34	..	..	..	..			068
	Means of 15	93	1			4 50	..	65 2	N b W 6				..	8		·50	..	N b W 5				3 32	845	4 50	N b W 6						779

Series 223.	22 3	75	1 26	2 60	11 39	4 52	00	65 5	NW	12	NW	11	cl	862 5	2 77	4 52	00	NW	14	NW	11	3 34	830	4 52	NW	12	NW	11	284	3 58	774
	21 3	75	1 26	2 90	11 45	52	00	5	N	13	N	13	c	833 4	2 65	52	00	NNW	12	NNW	12	3 28	820	52	N	13	N	13	288	3 61	743
	25 3	90	1 26	2 63	10 71	40	− 01	64 8	E	9	E	9	cl	817 5	2 72	40	00	E	3	SE	11	2 91	935	40	E	9	E	9	285	3 54	768
	14 1	94	1 26	3·00	11 45	35	− 01	9	N	13	N	13	cl	875 5	2 95	35	00	N	13	NW	10	3 29	837	30	N	11	NW	6	255	3 59	822
				2 90	11 46	35	00	9	NW	10	NE	[illegible]	c	847 9	2 86								80							3 58	790
	24 3	86	26	2 64	11 3	35	+ 02	7	NW	11	NW	10	c	800 0	2 70	35	+ 01	NW	10	NW	9	3 7	85		NW	11	NW	10	288	3 54	763
	8 2	88					00	3	V	l	N	7	cl	841 9	2 84	33	00	N	13	N	11	3 34	8		V	l	N	7	309	3 66	784
	27 2	44					− 01	6	NW	8	NW	9	c				00	NW	9	NW	11	3 27	85		NW	8	NW	11	304	3 63	769
							00	6	NW	11	NW	11	cl										85							3 63	766
	28 2	25					00	6	NW	10	NW	11	c				00	NW	11	NW	11	3 22	86		NW	10	NW	11			767
	18 1	81					00	4	N	15	N	16	cl				00	N	16	N	16	3 39	83		N	15	N	16			785
δ Range,		6					.	1 2	..		.	.						.		.	.	48	11		..	.					079
υ Means of 11		7						64 8	NNW 9									NNW 9				3 25	86		NNW 9						776
Series 224.	22 2	7					00	64 5	.	0		0	c				00		0		0	3 04	92		..	0	.				792
	4 3						00	5	V	l	NW	15	cl				00	NW	11	NW	12	3 18	87		V	l	NW	1			772
	27 3	8					00	4	.	0		0	c				00		0		0	3 04	86		.	0	.				761
	3 3						00	5	NW	19	NW	17	cl				00	NW	18	NW	18	3 35	81		NW	9	NW	1			758
	11 2	8					00	2	.	0	V	l	cl				00	.	0	V	l	3 00	91			0	V				763
	10 2	7					00	2	V	l	V	l	c				00	V	l	V	l	3 01	90		V	l	V				756
	22 1	8					00	3	N	13	N	15	cl				00	N	14	N	18	3 44	8		N	13	N	1			796
	13 2	8					00	1	N	14	N	14	c				00	N	12	N	14	3 35	8		N	14	N	1			789
	21 1	8					00	3	..	0	..	0	c				00	.	0	.	0	3 45	8			0	.				760
	21 2	5					00	1	..	0	V	l	cl				00	V	l	V	l	3 09	8			0	V				754
	25 3	5					00	0	..	0	V	l	cl				00	.	0	..	0	3 14	8		..	0	..				765
	„						00	0	„	,	„	,	c				„	.	.	,	,	„	8		„	„	„				762
δ Range		8					..	5	..	..	..	.					..	.	.	..	.	44	1		..		.	.			045
υ Means of 12		5					..	64 3	NNW 4									NNW 5				3 17	8		NNW 4						760
Series 225.	18 2	7					00	64 1	..	0	.	0	c				00	.	0	..	0	3 14	8		.	0					772
	17 2	7					00	1	..	0	.	0	cl				00	.	0		0	3 14	8		..	0					787
	8 3	7					+ 01	2	..	0	.	0	cl				+ 01		0		0	3 17	833	12		0	.				744
	10 3	8					− 02	1	NNW	12	NNW	13	c				00	NNW	11	NNW	12	3 14	860	09	NNW	12	NNW	1			771
	11 3	7					00	1	N	6	N	13	cl				00	NNE	7	NE	9	3 04	895	08	N	6	N	1			776
	17 3	7					− 01	1	NNW	16	NNW	18	c				00	NNW	14	NNW	14	3 20	841	08	NNW	16	NNW	1			763
	13 3	8					00	1	..	0	..	0	c				00	..	0	..	0	3 08	870	08	..	0	..				768
	14 2	7					00	63 9	..	0	..	0	cl				00	V	l	V	l	3 01	904	07	..	0	..				774
	7 3	1					00	64 1	.	0	..	0	c				00	..	0	..	0	3 08	873	06	..	0	.				758
	18 3	7					− 02	1	.	0	V	l	cl				− 02	.	0	V	l	2 90	914	05	..	0	V				761
	20 2	7					00	63 9	V	l	V	l	cl				00	V	l	V	l	3 13	872	04	V	l	V				776
	15 3	7					00	9	N	3	V	l	cl				00		0	.	0	3 05	879	04	N	3	V				768
	6 3	1					00	64 0	V	l	V	l	c				00	NW	11	NW	6	3 14	841	02	V	l	V				742
	15 2	7					00	63 7	SE	8	NE	6	c				00	E	6	NE	7	3 10	897	00	SE	8	NE				775
δ Range,		6					..	5	.	..		..		[illegible]		13		..	.		.	30	081	·13	..	.	..				045
υ Means of 14		6					..	64 0	N b W 3					[illegible]		4 07	..	N b W 3				3 10	875	4·07	N b W 3						760

TABLE LXX.

CENTRAL SURFACE AND MEAN VELOCITIES

SITES IN DISTRIBUTARIES

Serial No	Date 1879	Lont o	Fall of Water-Surface	3 Rod Velocity Results: Hyd Mean Depth R	Variation of water level	Surface Breadth b	Wind From Direction	Wind From Velocity	Wind To Direction	Wind To Velocity	T m keepe s Init a	Discharge in cubic feet per second D	Mean Velocity V	4 Central Surface Velocity Results: Hyd Mean Depth R	Variation of water level	Wind From Direction	Wind From Velocity	Wind To Direction	Wind To Velocity	Cent Surface Velocity v_o	Ratio V — v_o c	Distributary
231	23-3	?	?	2 79	00	25 0		0		0	C	190 7	2 51	2 79	00		0		0	2 95	851	RIGHT JAOLI
		?	?	79	+ 02	0		0		0	B	191 1	2 52								854	
δ Range,				00		0						4	01								003	
v Means of 2				2 79		25 0	Calm					190 9	2 5	2 79		Calm				2·95	853	
232	28-3	?	?	1 99	− 02	22 0		0		0	C	97 7	2 10	1·98	00		0		0	2 51	83	
		?	?	99	00	·0		0		0	B	97 7	2 10								83	
δ Range,				01		0						0	00								000	
v Means of 2				1·99		22·0	Calm					97 7	2 10	1·98		Calm				2 51	83	
233	13-3	Not observed	Not observed	35	+ 05	14 3		0		0	B	90·5	2 14	2 17	− 03	·	0		0	2 49	860	HANSURPUR
				33	15	3		0	N	l	C	89 5	2 14								860	
	18-3			31	+ 06	0		0		0	C	84 9	2 10	2 29	+ 02		0		0	2 43	·864	
				28	00	·0		0		0	B	80·6	2 03								83	
δ Range,				07		3						9 9	11	12						06	029	
v Means of 4				2 32		14 2	N l					86 4	2 10	2 23		Calm.				2 46	85	
234	1-3	?	?	10	00	13 8		0		0	C	72 6	2 01	2 10	00		0		0	2 44	810	
236	21 3	?	?	1 16	00	13 5	W	l	W	b	B	25 3	1 4	1 16	− 06	W	b	NW	b	1 9	85	N HANPUR
		?	?	16	+ 01	5	NW	b	NW	h	C	25 7	1 4								83	
δ Range,				00		0						4	00								000	
v Means of 2		?	?	1 16		13 5	W NW b					25 5	1 4	1 16		W NW b				1 9	83	
237	19 3	?	?	1 16	− 01	13·0	NW	l	W	l	C	62 8	1 82	2 1	− 02	NW	b	NW	b	2 26	80	TIHORI
	"	?	?	16	+ 06	0	NW	l	NW	l	B	63·3	1 84								814	
δ Range,				00		0						5	0								009	
v Means of 2		?	?	16		13 0	NW b					63 1	1 8	2 1		NW b				2 26	810	
238	20-3	?	?	1·06	− 02	12 5		0	W	l	B	52 2	1	1·01	− 03	W	l	W	l	2·09	·856	
		?	?	91	− 06		W	l	W	l	C	47 9	1 72								·818	
δ Range,				·05		0						4 3	08								03	
v Means of 2		?	?	1 04		12 5	W l					50·0	1	1 04		W l				2·00	83	

TABLES LVII. AND LXXI.—LXXIV.

MISCELLANEOUS VELOCITY EXPERIMENTS.

Surface, Bed, and Mean Velocities and Discharges, ...	Series 241 to 243,	Table LVII (*see* page 114)
Experiments on Length of Run—		
Mean Velocities and Discharges, „	251,	Table LXXI.
Central Surface Velocities, ... „	252,	„ LXXII
Unsteady Motion, Central Surface Velocities, ..	.. „	LXXIII
Unsteady Motion, Central Velocities, . ..	... „	LXXIV

Series 241 to 243, (Table LVII.) are Surface-, Bed-, and Rod Velocity work executed in concert; the velocity measurements of each kind were made in as rapid succession as possible, one after the other, upon each vertical from Left Bank to Right Bank. Thus one SET of each kind was executed under the same External Conditions, and the Mean Results of each SERIES are therefore completely intercomparable, being under same conditions, (though not freed from effects of Unsteady Motion) For explanation of arrangement of Table, *see* pages 57, 67

Series 251, 252 are Experiments on Length of Run. Each Float was timed in passing under 4 Ropes in succession, so that velocity measurements are deducible from the same Float through four different RUNS. The discrepancies are shown in the bottom lines (marked δ)

Series 251 contains 4 SETS of Mean Velocity work (*i e*, 1 Set for each of the four Runs) similar to those of Tables L, LI For explanation, *see* page 67

Series 252 contains the "Timings" (through the four Runs) of the 48 Floats used for a single Average Central Surface Velocity Measurement (v_0), as used in Col. 4 of Tables LVIII. to LXX.

Tables LXXIII and LXXIV illustrate Unsteady Motion. Table LXXIII. is a selection (from Tables LVIII. to LXX.) of 17 Sets of Central Surface Velocity-Measurements, (each Set consisting of 48 trials done in rapid succession) showing the maximum, minimum and mean velocity Results, and also the Range thereof in each Set (both actual and per centum) at eight different Sites, as well as the duration of each Experiment (in minutes), the state of the Wind at beginning and end thereof, and the maximum Deviation (from the Pendants of Upper and Lower Ropes) admitted for each Float.

Table LXXIV is a similar selection of 10 Sets of Central Velocity-Measurements at various depths with different Instruments at two Sites, showing Results as in Table LXXIII These Sets do not appear in the Tables preceding this.

EXPERIMENT ON LENGTH OF RUN.

TABLE LXXI.

Mean Velocities and Discharges—Belra Site.

[*Instruments*—1″ *tin Tube-Rods*]

These 4 Sets were executed together throughout, (the four velocity measurements of each Float-Course being taken *from the same Float*) so that the External Conditions are the same for all 4 Sets

Serial No.	1	2					3	4	6																6	7	8
	Date, 18 9	Depth.			Surface-Breadth	Area.	Wind	Timekeeper's Initial	Mean Velocities past each vertical Each Float was timed in passing under four Ropes in succession by same Timekeeper (Each Velocity is the mean of three observations).																Cubic Discharge in cub feet per sec	Mean Velocity.	Length of Run
		At Gauge.	Variation	Central.					Left of centre								Centre	Right of centre										
									Edge	Side-slope m	Side-slope 90	80	70	60	40	20		20	40	60	70	80	Side-slope 90	Side-slope m	Edge			
		δ		H	b	A																				D	V	
251	11 2	5·88	− 0·03	8·12	180·0	1473·4	Calm	P	?0	1·76	2·0	2·88	2·68	3·06	3·00	2·94	3·00	3·06	3·23	3·06	2·73	2·50	1·38	1·25	?0	4,30	2·92	Upper 25′ Run
									?0	1·76	2·26	2·94	2·88	3·03	3·13	3·03	3·33	3·03	3·16	3·16	2·94	2·70	1·74	1·52	?0	4,503	3·06	Lower 25 Run
									?0	1·76	2·07	2·84	2·79	3·13	3·09	2·97	3·19	3·19	3·17	3·06	2·87	2·54	1·64	1·37	?0	4,41	3·00	Middle 50′ Run
									?0	?	2·10	2·88	2·78	3·28	3·08	2·98	3·17	3·12	3·18	3·08	2·85	2·57	1·59	?	?0	4,400	2·99	Outer 100′ Run
δ Ranges,		00	..	·00	0	0	..	.	?	00	23	06	·20	03	13	·09	·33	03	07	10	21	·20	·36	27	?	198	14	In 25′ Runs
		00	..	·00	·0	0	..	..	?	?	03	04	01	·05	01	01	02	07	01	02	02	03	0	?	?	15	·01	In 50′ & 100′ Runs

TABLE LXXII

EXPERIMENT ON LENGTH OF RUN

Central Surface Velocities—Belra Site

[*Instrument—3" Surface Floats*]

Date 13 2 79—Gauge-Depth h = 5 53 Variation = 00 Central Depth H = 8 03 Surface Breadth b = 18? 3 Wind Down stream Light at first Calm at end.

These 4 Sets were executed together throughout the four velocity measurements of each Float-Course being taken from one Float) so that the External Conditions are the same for all 4 Sets

Serial No.	Date	Run	Timekeeper	Timings of Floats (Each Float was timed past four Ropes in succession by same Timekeeper) — Number of Float 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Time unit
252	13-2 79	Upper 25	A	28	27	30	27	30	30	30	27	26	29	26	28	30	31	30	30	29	30	30	30	30	28	28	30	Quarter seconds
		Lower 25	A	28	26	30	26	26	30	32	26	25	28	29	28	29	26	28	28	28	28	30	30	28	30	31	30	Quarter seconds
		Middle 50	A	26½	26½	29	27½	26½	29	31	27½	27	28	27	28	27	32	31	28	27½	29	30	28	29	28	27½	29	Half seconds
		Outer 100	A	27½	26½	29½	27	27½	29½	31	27	26½	28½	27½	28	28½	30½	30	28½	28	29	30	29	29	28½	29½	29	Seconds
δ Range		of 25 Runs,		0	1	0	1	4	0	2	1	1	1	3	0	1	5	2	2	1	2	0	0	2	2	4	0	Quarter seconds
		of 50 & 100 Runs		½	0	½	½	½	½	0	½	½	½	¼	0	1½	1½	1	½	½	0	0	1	0	½	¼	½	Half seconds

Serial No.	Date	Run	Timekeeper	Number of Float 25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Time unit
252	13 2 79	Upper 25	P	28	29	30	28	27	29	30	28	29	28	30	28	28	26	31	32	28	29	29	30	31	36	28	34	Quarter seconds
		Lower 25	P	28	27	28	29	30	27	26	29	28	25	30	28	30	28	32	29	32	27	27	29	29	28	29	27	Quarter seconds
		Middle 50	P	28	28½	28	26	26	28	27½	28	27	29	30	29	28	24½	31½	31½	28	29	28	27	30	31	27½	29½	Half seconds
		Outer 100	P	28	28½	28½	27½	27½	28	27½	28½	27½	27½	30	28½	28½	27½	31½	31	29	28½	28	28½	30	31½	28	30	Seconds
δ Range		of 25 Runs,		0	2	2	1	3	2	4	1	1	3	0	0	2	2	1	3	4	2	2	1	2	8	1	7	Quarter seconds
		of 50 & 100 Runs		0	½	½	1½	1½	0	½	½	½	1½	0	½	½	¼	0	½	1	½	0	1½	0	½	½	½	Half seconds

UNSTEADY MOTION—CENTRAL SURFACE VELOCITIES

TABLE LXXIII

[Instruments—3" Surface Floats]

These Sets are selected from those in Tables LVIII to LXX two Sets for each Site one near the highest and one near the lowest water level available in calm weather

Reference No	DATE 1876 79	SITE	CROSS SECTION DATA			Velocity sought	Instrument	Duration of Experiment in minutes	Number of Trials	WIND				MAX. DEVIATION admitted		VELOCITIES					RANGE of velocities	
										From		To				Observed		Means				
			Shape of Section	Surface Breadth	Central Depth					Directn	Velocy	Directn	Velocy	Left	Right	Max	Min	of first half set	of last half-set	of whole	Actual	Per cent [of mean]
1	24 2 79	Jaoli, ...	Trapezoidal	192	8 12	Central Surface Velocity	3" Surface Floats [3" x ¼" pine Discs]	30	48	Calm				2'	2'	3 57	2 94	3 31	3 29	3 30	63	19 1
2	11 3 79			191	6 72			35	48	Calm				2'	2'	3 33	2 86	3 02	3 06	3 04	77	25 3
3	27 3 79	Belra . ..	Trapezoidal	189	9 88			35	48	Calm				2'	2'	4 00	3 17	3 61	3 57	3 59	83	23 1
4	14 2 79			187	7 98			35	48	Calm				2'	2'	3 77	3 08	3 39	3 38	3 38	69	20 4
5	23 4 78	Fifteenth Mile, .	Trapezoidal	175	10 04			20	48	Calm				2'	2'	5 00	4 00	4 57	4 59	4 58	1 00	21 8
6	10-4 78			175	9 19			15	48	Calm				2'	2'	5 00	4 00	4 47	4 44	4 46	1 00	22-4
7	29 5 78	Soláni Embankment Main Site,	Trapezoid above 4 } Rectang below 4 }	171	11 24			45	48	Calm				2'	2'	4 65	4 08	4 38	4 36	4 37	57	13 0
8	19 9 78		Rectangular	150	2 28			60	48	Calm				2'	2	1 08	88	96	1 00	98	20	20 4
9	31 5 77	Soláni Right Aqueduct	Rectangular	82	10 02			70	48	Calm				2'	2'	5 00	4 17	4 56	4 53	4 55	83	18 2
10	31 7 76			85	3 59			20	48	Calm				2'	2	3 03	2 67	2 91	2 89	2 90	36	12 4
11	1 9 76	Soláni Right Aqueduct (Left Aqueduct closed)	Rectangular	85	4 00			28	48	Calm				2'	2'	6 67	5 26	5 80	5 75	5 79	1 41	24 4
12	27 1 79	Kamhera,	Trapezoidal	65	5 22			40	48	Calm				1'	1'	3 0	3 03	3 35	3 3	3 33	67	20 1
13	15 3 79			64	4 41			40	48	Calm				1'	1'	3 33	2 86	3 04	3 06	3 05	47	15 4
14	20 3 79	Right Jaoli Distributary,	Trapezoidal	25	3 82			50	48	Calm				3"	3"	3 13	2 86	2 96	2 94	2 95	27	9 2
15	28 3 79			22	2 56			40	48	Calm				3	3	2 70	2 33	2 47	2 52	2 51	37	14 7
16	18 3 79	Mansúrpur Distributary	Trapezoidal	14	3 39			25	48	Calm				3"	3	2 63	2 27	2 41	2 44	2 43	36	14 8
17	12 3 79			13½	3 08			55	48	Calm				3"	3"	2 70	2 27	2 42	2 46	2 44	43	17 6

TABLE LXXIV.

UNSTEADY MOTION—CENTRAL VELOCITIES.

[*Instruments—Double Floats, Current Meters, and loaded 1" Rods*]

* In Sets Nos. 9 and 10 the actual Deviation of each Float was recorded.

Reference No.	DATE, 1875 78	SITE	CROSS-SECTION DATA			Velocity sought.	Instrument.	Duration of Experiment in minutes	Number of Trials	WIND				MAX DEVIATION admitted		VELOCITIES					RANGE of velocities.	
			Shape of Section	Surface Breadth	Central Depth					From		To				Observed		Means				
										Directn	Velocy	Directn	Velocy	Left	Right	Max	Min	of first half set	of last half set	of whole	Actual.	Per cent. of mean.
1	7-6-77	Soláni Right Aqueduct,	Rectangular, ..	82½	9 75	At 5 depth,	Double-Float (1½" copper Ball),	80	48	?		?		2	2	4 65	3·92	4 35	4 26	4 31	·73	16 9
2	„			„	9 65	ditto,	Current Meter, (Moore's)	85	12	V	12	V	20	..	..	4 36	3 84	4 13	4 11	4 12	52	12 6
3	11 3-75	Soláni Right Aqueduct,	Rectangular ..	84½	7 55	At 6 depth,	Double-Float, (3" wood Ball)	?	48	..	0	..	0	2	2	3 85	2 78	3 35	3 43	3 39	1 07	31 6
4	„			„	„	ditto,	Double-Float 3" tin Discs)	?	48	..	0	..	0	2	2	4 08	3 03	3 50	3 42	3 46	1 03	30 3
5	„			„	„	ditto,	Twin 3" wood Balls.	?	48	..	0	..	0	2	2'	4 00	3 08	3 50	3 47	3 48	92	26 4
6	„			„	„	Surface,	3" pine Discs	?	48	..	0	..	0	2	2'	4 17	3 03	3 75	3 80	3 78	1 14	30 2
7	9-6 76	Soláni Right Aqueduct,	Rectangular, .	62	9 90	At 9 depth,	Double Float, (1½" copper Ball)	90	40	E	5	NE	12	2	2	5 00	3 92	4 42	4 37	4 41	1 08	24 5
8	„			„	9 98	ditto,	Current Meter, (Moore's)	90	20	NE	12	V	15	..	..	4 74	2 77	3 37	3 50	3 44	1 97	57 3
9	19-3 78	Soláni Embankment, Main Site,	Trapezoid above 4, Rectangle below 4,	168	10 25	Surface,	3" pine Discs	225	100	W	5	S	4	*12	*11'	5 13	3 85	4 36	4 33	4 35	1 28	29 4
10	„			„	„	Mean, (on centre vertl.)	1" tin Rod (immersed 9')		100	„	„	„	„	*5'	*5	4 44	3 33	3·95	3 86	3 91	1 11	28 4

a

TABLES LXXV.—LXXXII.

WATER-LEVEL, SURFACE-CONVEXITY, AND SURFACE-SLOPE.

Still and Free Water-Levels, ...	Table LXXV.
Effect of Wind on Water-Level at Edges, ...	„ LXXVI.
Convexity of Water-Surface, ...	„ LXXVII.
Convexity of Water-Surface, ...	„ LXXVIII.
Surface-Slope Measurements in 2000′ and 4000′ Slope-Lengths, ...	„ LXXIX.
Surface-Slope Measurements on Both Banks at some hours' interval, ...	„ LXXX.
Surface-Slope Measurements on Both Banks at a few minutes' interval,	„ LXXXI.
Simultaneous Surface-Slope Measurements at several Sites, ...	„ LXXXII.

Table LXXV shows the Reduced Levels of Water-Surface as determined *in succession*, (not simultaneously) by a Still Water Gauge (Stand-Pipe) and by a Range of Pegs in the Free Channel showing the Still and Free Water-Levels respectively, at the Fifteenth Mile (Old Site) and at the two Slope Points 1000′ above and 1000′ below, Left Bank

Table LXXVI. shows the effect of high cross wind in raising and depressing the Surface Level at the Edges each pair of readings (one for either Bank) being *strictly simultaneous.*

Tables LXXVII. and LXXVIII. show the differences of surface level at opposite banks, and the elevation (or depression) of surface at centre above (or below) the surface at either edge the readings of variable levels $(h, C', c', h'', C'', c'')$ being made *strictly simultaneously*

Tables LXXIX.—LXXXII. show details connected with various Surface-Slope Measurements computed as the quotient,—

$$\text{“Surface Slope} = \frac{\text{Surface Fall in Slope-Length”}}{\text{Slope-Length}}.$$

In every case the two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous* In all cases 3 decimals (·000) must be prefixed to the Surface-Slope Results by the reader, (these having been omitted to save space)

Table LXXIX shows details of Surface-Slope Measurements in different (2000 and 4000) Slope Lengths on same bank, symmetric about the centre of the Site, those of the 4000′ Slope-Lengths being made about 5 minutes (being the time occupied in traversing the extra distance) after those of 2000′ Slope-Length, and by the same Observers.

Tables LXXX, LXXXI., show details connected with Surface-Slope Measurements on both Banks, each pair by the same Observers. Those on right bank in Table LXXX. were made 2 or 3 hours after (being the time occupied by a Discharge-Measurement) those on left bank at same Site. Those on right bank in Table LXXXI. were made about 2 or 3 minutes after (being the time occupied in crossing the Canal) those on left bank

Table LXXXII shows details connected with Surface-Slope Measurements *executed simultaneously* at three Sites in the Roorkee Reach.

TABLE LXXV.

STILL AND FREE WATER-LEVELS

At Fifteenth Mile, (Old Site,) and at (the Slope-Points) 1000 above and 1000' below, (Left Bank)

[*Instruments—Temporary Still Water (Stand-Pipe) Gauge, and Temporary Free (Peg) Gauge*]

(+ and – indicate Free Water-Level shown by Peg) higher or lower than Still Water Level (shown by Stand Pipe))

Date, 18 8.	Water-Level above Experimental Site					Water Level at Experimental Site						Water Level at 1000 below Experimental Site				
	F	• on eg	Reduced Level Pipe	Reduced Level Peg	Diff	Vel'y	Readings on Pipe	Readings on Peg	Reduced Level Pipe	Reduced Level Peg	Diffce	Readings on Pipe.	Readings on Peg	Reduced Level Pipe	Reduced Level Peg	Diffce
25-3	3	to 61	3 420	3 460	+	8	3 300	61 to 59	3 200	3 230	+ 030	..	.. ..	..	..	.
	3	„ 61	3 410	3 480	+	7	3 300	62 „ 60	3 200	3 240	+ 040	3 870	68 to 66	2 960	3 000	+ 010
4 4	3	„ 63	3 450	3 485	+	0	4 310	67 „ 64	3 230	3 285	+ 055	3 950	72 „ 70	3 040	3 040	000
	3	„ 66	3 460	3 515	+	0	4 310	67 „ 64	3 230	3 285	+ 055	3 940	73 „ 71	3 030	3 050	+ 020
8 4	3	„ 61	3 430	3 465	+	0	4 300	62 „ 60	3 220	3 240	+ 020	3 910	69 „ 67	3 010	3 010	000
	4	„ 73	3 530	3 585	+	0	4 420	75 „ 74	3 340	3 375	+ 035	4 030	80 „ 78	3 120	3 120	000
10 4	4	„ 98	3 780	3 835	+	0	4 660	97 „ 96	3 580	3 595	+ 015	.	.. .	.	..	..
	4	„ 98	3 780	3 835	+	0	4 650	99 „ 95	3 570	3 600	+ 030	..	.. ..	.	..	..
15-4	3	„ 36	3 180	3 215	+	4	4 060	39 „ 36	2 980	3 005	+ 025	3 630	44 „ 42	2 720	2 760	+ 040
	3	„ 31	3 140	3 165	+	0	4 030	36 „ 33	2 950	2 970	+ 020	3 600	41 „ 39	2 600	2 730	+ 040
16-4	3	„ 10	2 940	2 955	+	0	3 800	14 „ 11	2 720	2 755	+ 035	3 380	17 „ 15	2 470	2 490	+ 020
	3	„ 13	2 940	2 975	+	0	3 810	15 „ 12	2 730	2 765	+ 035	3 380	22 „ 19	2 470	2 535	+ 065
23 4	4	„ 96	3 780	3 815	+	0	4 670	99 „ 97	3 590	3 610	+ 020	4 325	10 „ 08	3 415	3 360	− 055
	4	„ 95	3 760	3 805	+	0	4 660	98 „ 96	3 580	3 600	+ 020	4 330	08 „ 07	3 420	3 345	− 075
24 4	4	„ 97	3 780	3 820	+	3	4 680	99 „ 97	3 600	3 610	+ 010	4 380	08 „ 07	3 470	3 345	− 125
	4	„ 97	3 775	3 825	+	0	4 670	1 00 „ 98	3 590	3 620	+ 030	4 360	11 „ 09	3 450	3 370	− 080
25 4	4	„ 95	3 780	3 800	+	0	4 670	98 „ 96	3 590	3 600	+ 010	4 250	09 „ 08	3 340	3 355	+ 015
	4	„ 93	3 760	3 770	+	0	4 150	96 „ 94	3 570	3 580	+ 010	4 245	08 „ 06	3 335	3 340	+ 005
20-4	4	„ 91	3 750	3 760	+	0	4 640	94 „ 93	3 560	3 565	+ 005	4 370	05 „ 05	3 460	3 320	− 140
	4	„ 91	3 745	3 765	+	0	4 630	96 „ 94	3 540	3 580	+ 040	4 345	08 „ 06	3 435	3 340	− 095
1 5	4	„ 89	3 730	3 740	+	0	4 610	92 „ 90	3 530	3 510	+ 010	4 190	03 „ 01	3 280	3 290	+ 010
	.	..	..	..	..	0	4 600	90 „ 90	3 520	3 530	+ 010	..	.. .	..	..	..
25-5	..	..	..	..	..	1	5 340	97 „ 96	3 705	3 710	+ 005	..	.. ..	..	..	..
	..	..	..	..	..	3	5 360	99 „ 98	3 725	3 730	+ 005	..	.. ..	..	..	..
Ranges	in 21 trials,		840	880	+	in 24 trials			1 005	975	050	in 18 trials,		1 000	880	205
Means	„ „		3 530	3 575	+	„ „			3 377	3 401	+ 024	„ „		3 118	3 100	− 018

Reduced Levels above Karáchi mean sea level

Stand Pipe Indicators (Deduct 6 for length of Float-stick.)
- at 1000 above Experl Site: 875·50 throughout
- at Experimental Site: 875·30 on 23 3 78; 874·92, from 4 4 78
- at 1000' below Experl Site, 875·03, throughout.

Tops of Pegs
- at 1000 above Experl Site: 872·85 throughout.
- at Experimental Site, 872·63 throughout
- at 1000' below Experl Site: 872·83 till 16 4 78; 872·77 from 23 4 78

Note.—870' is omitted in the Reduced Levels in Table for shortness.

TABLE LXXVI.

EFFECT OF WIND ON WATER-LEVEL AT EDGES

Solání Embankment, Main Site.

The readings of variable level, (viz. h h',) were made strictly simultaneously

Date	Expert. No	Wind		Depth on top immersed step.		Difference of Surface-Level at edges.		General Data						Abbreviations	Diffce of Surface-Level at edges.
		Direction.	Velocity	L. Edge.	R. Edge.			Depth		Surf Breadth	State of Canal.	Highest wet step.			
				h	h'	L>R	R>L	Gauge.	Central			No	Diffce of Level		
10-8-'78	1	W	17	34 to 28	46 to 45	035	..	7 29	about 8 47	161·7	Rising	8th on both Banks	180, (L > R)	L > R means Left higher than Right R > L means Right higher than Left.	180−(h'−h)
	2	..	.	34 „ 28	47 „ 44	035	..								
	3	..	.	35 „ 29	48 „ 44	040	..								
	4	..	..	35 „ 28	47 „ 46	030	.								
	5	..		33 „ 28	48 „ 46	015	..								
	6	W	18	36 „ 28	50 „ 45	025	..								
Range,		..	.	03	·06	025	..								
Means,		W	15	..	..	·030									
30 5 '79	1	E	27	25 to 15	55 to 2	000	000	10 12	about 11 30	171 0	Falling?	4th on both Banks	200, (L > R)		200−(h'−h)
	2	..	..	25 „ 12	49 „ 28	000	000								
	3	..	.	25 „ 12	51 , 20		015								
	4	..	.	26 „ 10	48 „ 28	000	·000								
	5	..		25 „ 10	55 „ 2		035								
	6	.		29 „ 15	59 „ 27	055									
	7	..	.	24 , 09	49 , 26		·010								
	8	..		25 „ 05	52 „ 2		045								
	9	..	.	28 „ 11	54 „ 28	..	015								
	10	E	30	25 „ 05	55 „ 29	..	070								
Range		..		24	32	055	070								
Means,		E	29	..	..	..	·014								

TABLE LXXVII.

CONVEXITY OF WATER-SURFACE.

Solani Embankment, Main Site 19 5-'77.

The readings of variable levels, (viz. h C' c' h C' c') were made strictly simultaneously

Each Reading-entry is the mean of three Readings.

For explanation of Symbols and Results, see Table LXXVIII

Expert No	Readings from Left Bank.				Readings from Right Bank.				Difference of Level of Water Surface					General Data.
									At Edges		Elevation of centre above			
	H	h	C'	c'	H'	h'	C'	c'	L>R	R>L	L. Edge	R. Edge	Mean of Edges.	
1 to 3	4 765	025	4·667	·089	4 809	219	4 547	·084	..	004	− 016	− 044	− ·030	Depth above datum = 9·28 Central depth = 10·41 Surface breadth = 168·7 Wind Calm throughout State of Canal Rising Number of top immersed step = 8th Diffce of Level of top immersed steps on either bank = 190 (L > R)
4 „ 6	„	027	4 659	120	„	225	4 492	135	.	003	+ 009	− 043	− 017	
7 „ 9	4 ,60	034	4·619	109	4·850	228	4 506	098	.	004	− 002	+ 018	+ ·005	
10 „ 12	„	·031	4 640	092	„	226	4 5 8	·082	.	005	− 003	+ 014	+ 006	
Range,	005	009	038	031	041	009	055	053	..	004	025	062	·038	
Means,	..		.	..	..	.	..		..	·005	−·003	− ·014	− ·008	

TABLE LXXVIII.

CONVEXITY OF WATER-SURFACE.

Solání Embankment, Main Site 23-6 '77

(The readings of variable levels, (viz h C′ c h° C° c°) of each line were made strictly simultaneously.)

Expt. No.	Readings from Left Bank.				Readings from Right Bank.				Difference of Surface Levels				General Data.	Results	Symbols.
									at Edges	Elevation of centre above					
	H	h	C′	c′	H°	h°	C°	c°	R	L Edge	R Edge	Mean of Edges			
1	H = 4 618 throughout	075 to 045	4 390 to 4 380	195 to 180	H° = 4 725 throughout	163 to 245	4 300 to 4 290	200 to 150		− 015	+ 001	− 007	Depth of water above datum = 9′ 99 to 10′ 07 Depth at Solání Gauge = 10′ 00 Central depth = about 11′·20 Breadth of Water Surface = 171′ 0 Wind Calm throughout, Canal Rising Central Surface Velocity = 4·49. Number of top immersed step = 4th on both banks Difference of Level of top immersed steps on either bank = 196 L > R	Difference of surface level at edges = 196 − (h° − h). Elevation of water surface at centre above either edge = (H − h) − (C + c). (Elevation shown by +, Depression by − sign)	H = Reading of Levelling Staff on top immersed step h = Height of water surface above top immersed step C = Reading of Levelling Staff over centre of stream c = Reading of Continuation strip of Levelling Staff at centre. [L > R means Left above Right. R > L means Right above Left.]
2		070 „ 050	4 390 „ 4 380	190 „ 180		261 „ 240	4 300 „ 4 290	190 „ 140		− 012	+ 014	+ 001			
3		·070 „ 040	4 400 „ 4 385	190 „ 175		263 „ 238	4 305 „ 4 295	180 „ 140		− 007	+ 014	+ 004			
4		085 „ 040	4 390 „ 4 375	180 „ 170		270 „ 231	4 300 „ 4 285	210 „ 160		− 002	− 004	− 003			
5		090 „ 050	4 420 „ 4 405	150 „ 140		266 „ 244	4 325 „ 4 315	160 „ 130		− 010	+ 005	− 003			
6		·080 „ 060	4 420 „ 4 410	150 „ 135		270 „ 241	4 325 „ 4 320	150 „ 120		− 010	+ 011	+ 001			
7		080 „ ·060	4 435 „ 4 410	140 „ 111		276 „ 250	4 350 „ 4 330	140 „ ·090		− 007	+ 007	Nil.			
8		080 „ 050	4 440 „ 4 430	130 „ 110		280 „ 252	4 355 „ 4 340	140 „ 080		− 002	+ 001	− 001			
9		080 „ 060	4 450 „ 4 435	115 „ 105		275 „ 254	4 360 „ 4 345	150 „ 090		− 005	− 012	− 009			
10		090 „ 050	4 450 „ 4 440	115 „ 100		273 „ 251	4 360 „ 4 350	140 „ 070		− 005	+ 002	− 002			
11		080 „ 050	4 445 „ 4 435	115 „ 100		280 „ 256	4 365 „ 4 350	140 „ 080		+ 010	− 011	− 001			
12		090 „ ·030	4 550 , 4 555	095 „ ·085		255 „ ·280	4 370 „ 4 365	120 „ 010		− 095	− 005	− 050			
13	H = 4·615 throughout	095 to 055	4 285 to 4 280	270 to 250	H° = 4 727 throughout	310 to ·280	4 200 to 4 190	280 to 265		− 003	− 041	− 022			
14		098 „ 060	4 290 „ 4 285	260 „ 240		310 „ ·290	4 205 „ 4 195	265 „ 255		− 002	− 033	− 018			
15		100 „ 063	4 295 „ 4 290	263 „ 250		280 , 260	4 205 „ 4·195	230 „ 255		− 018	− 011	− 015			
16		100 „ 061	4 315 „ 4 300	220 „ 210		290 „ 270	4 225 „ 4 210	260 „ 230		+ 011	− 016	− 003			
17		080 „ 064	4 320 „ 4 305	240 „ 220		290 „ 255	4 300 „ 4 150	260 „ 235		Nil	− 018	− 009			
18		100 „ 056	4 320 „ 4 310	230 „ ·220		280 „ 265	4 250 „ 4 150	255 „ 240		− 003	+ 007	+ 002			
19		100 „ 057	4 305 , 4 290	230 „ 215		280 „ 270	4 210 „ 4 200	255 „ 235		+ 016	+ 002	− 009			
20		096 „ ·062	4 315 „ 4 305	243 „ 215		285 „ 265	4 225 „ 4 210	260 „ 245		− 004	− 018	+ 011			
21		115 „ 055	4 320 „ 4 310	215 „ 210		290 „ 260	4 225 „ 4 220	260 „ 230		− 003	− 016	− 010			
22		096 „ ·056	4 330 „ 4 310	215 „ 200		280 „ 260	4 335 „ 4 230	265 „ 220		+ 006	− 018	− 006			
23		100 „ 060	4 335 „ 4 325	215 „ 207		280 „ 260	4 240 „ 4 230	255 „ 215		− 003	− 013	− 008			
24		110 „ 065	4 333 „ 4 325	225 „ 210		280 „ 260	4 140 „ 4 235	240 „ 215		− 022	− ·008	− 015			
Ranges,		.. ..	.. ..	.. ..		.. ..	.. ..	.. ..		− 002	− 015	− 009			
Means,		.. ..	.. ..	.. ..		.. ..	.. ..	.. ..		− 009	− ·007	− 006			

TABLE LXXIX.

SURFACE SLOPE MEASUREMENTS IN 2000 AND 4000 SLOPE LENGTHS

The two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous*. Those required for the 4000′ Slope-Length were taken about 5 minutes after those of the 2000′ Slope-Length (and by the same Observers).

SITE		Solani Right Aqueduct Site, Right Bank.											Embankment	
Date, 1876.		2-6	3-6	5-6	14-6	17-6	18-7	19-7	20 7	21-7	22-7	24-	5-9	
Wind, ...		v l	c	c	v l	ENE l	c	c	c	c	c	c	c	Solani Embankment, Main Site, Left Bank
Gauge at Experimental Site, .		9 54	9 62	10 00	9 96	9 98	7 06	6 87	6 65	7·05	4 30	6 25	7 47	
Surface-Fall (in feet)	from 2000 to 1000 above Site,	·15	16	18	18	19	12	10	12	11	08	10	25	
	in 1000 above Site, .	24	24	19	22	20	23	24	24	24	28	35	20	
	in 1000 below Site .	15	13	18	16	19	25	22	22	22	38	19	22	
	from 1000′ to 2000 below Site	11	13	13	·14	·14	10	11	11	13	07	12	23	
Surface Slope,	in 2000 .. .	195	185	185	190	195	240	230	230	230	330	270	210	
	in 4000, .	163	165	170	175	180	175	168	173	175	203	240	225	

SURFACE SLOPE-MEASUREMENTS ON BOTH BANKS TABLE LXXX.

The two water-level determinations concerned in each (individual) Surface-Slope Measurement were *strictly simultaneous*. Those of the Right Bank were made from 2 to 3 hours after those on Left Bank at same Site (and by the same Observers).
The Sub-Column Variation shows the Variation of Gauge-Reading in the interval (occupied by Discharge-Measurement).
The Reference Nos. refer to Abstract Tables 29, 30.

Reference No.	Date 1878 9	Solani Embankment Main Site								Solani Twin Aqueducts							
		Depth		Wind				Surface Slope		Depth		Wind				Surface Slope	
				From		To						From		To			
		Gauge Reading.	Variation	Dirn	Vely	Dirn.	Vely	Left Bank	Right Bank	Gauge Reading	Variation	Dirn	Vely	Dirn.	Vely	Left Bank	Right Bank
7	18 12 78	3 88	– 01	S	5	E	7	225	228	.	..	..	.	..	.	..	..
17	14 12- ,,	.	..	..	.	.	.	..		9·99	– 03	NE	4	?	?	183	175
18	19·12 ,,	9 91	+ 04	E	4	E b S	8	223	225	87	– 03	SE	l	NE	l	190	200
19	20-12- ,,	88	– 01	S	3	W	10	228	239	83	– 02	..	0	SW	12	195	205
20	15-4 79	43	+ 15	W	9	W	25	265	218	40	+ 09	NW	l	SW	12	215	200
21	12-4 78	47	00	E	8	E	8	205	228	46	+ 16	SE b S	7	E	23	198	190
22	28-5- ,,	50	– 01	W	7	W	9	243	235	45	– 06	W	6	V	l	205	188
23	27-5 ,,	45	– 01	V	l	V	9	220	235	39	– 02	SW b W	8	SW	13	210	190
24	6 4- ,,	8 75	00	W	6	W	6	215	233	8·67	00	NW	2	NW	3	275	193
25	20-3 ,,	53	– 21	SW	l	WSW	l	199	230	48	– 25	SW	l	WSW	l	218	198
26	21 3 ,,	24	00	SE	3	V	l	204	239	18	– 03	SE	3	V	l	290	228
27	12-3- ,,	05	00	SE	6	SE	6	200	224	7 99	– 02	SE	6	SE	8	210	195
28	9-3 ,,	7 63	– 02	..	0	..	0	214	255	55	00	..	0	..	0	220	203
29	8 3 ,,	61	– 01	W	10	V	l	211	241	53	– 04	SW	9	NW	l	223	205
30	11 3 ,,	60	– 01	.	0	..	0	218	233	51	– 01	.	0	.	0	235	205
31	7 3- ,,	61	00	S b W	6	W	7	213	238	50	00	S	6	S	7	203	213

N B —For numerous other Non-simultaneous Surface-Slope Measurements on opposite Banks, (at Fifteenth Mile, Belra, Jaoli, and Kambera Sites) see Detailed Tables XLIX—LV

SURFACE SLOPE-MEASUREMENTS ON BOTH BANKS TABLE LXXXI.

Date.	Gauge	Wind	Surface Slope		Solani Embankment Main Site Remarks
			L. Bank	R. Bank	
8-12 76	9 57	Calm	203	213	
9 12- ,,	9 77	Calm.	138	153	

SIMULTANEOUS LOCAL SURFACE-SLOPE MEASUREMENTS.

At Fifteenth Mile, and Solani Sites

(The Slope-measurements on same bank were executed at each of the Sites strictly simultaneously.)

The "Variation of Gauge" entry shows the variation during 2 or 3 hours Field work (Discharge-Measurement) done in connexion with these Slope-Measurements.

Reference No	Date, 1878	Fifteenth Mile Sites.				Solani Embankment Main Site				Solani Aqueduct Sites.				Surface-Slope (S) (Simultaneous).			
		Gauge Reading	Variation of Gauge	Wind		Gauge-Reading	Variation of Gauge	Wind		Gauge Reading	Variation of Gauge	Wind.		Fifteenth Mile.	Solani Embankment	Solani Twin Aqueducts.	Bank.
		h		Direction	Velocity	h		Direction	Velocity	h		Direction.	Velocity				
1	18-12	15 21	− 03	W	3	9 9.	− 01	S	5	?	..	..	.	215	215	?	L
2	19 12	16	+ 01	..	0	89	+ 04	E	4	9·89	− 01	SE	1	213	228	190	L
3	20 12	?	..	..	.	88	− 01	S	3	83	00	..	[illegible]	?	228	195	L
4	23- 5	15 30	+ 02	NW	1	10 06	− 07	W	8	No Field work	..	..	.	240	213	No Observations.	L
5	10 4	14·83	− 01	..	[illegible]	9 10	+ 02	W	1		..	..	.	253	215		L
6	8- 4	13 97	− 12	..	0	8·79	+ 05	W	1		..	..	.	228	215		L
7	4- 4	98	00	..	[illegible]	79	+ 01	W	0		..	..	.	223	217		L
8	20 "	95	00	N	8	74	− 02	W	20		..	..	.	230	205		L
9	14-12	No Field-work at this Site on these days.	..	..	.	10·01	− 05	E	7	9 99	− 03	NE	4		230	18,	L
10	12- 4		..	..	.	9 47	00	E	6	·35	+ 16	SEbS	7		205	198	L
11	"		..	..	.	·47	"	E	8	51	"	E	2	No Observations.	228	190	R
12	23- 5		..	..		50	− 01	W	7	48	− 06	W	6		243	205	L
13	"		..	..	.	49	"	W	9	42	"	W	1		235	188	R
14	27- 5		..	..	.	45	− 01	W	1	40	− 02	SWbW	6		220	210	L
15	"		..	..	.	44	"	W	9	·38	"	SW	17		233	190	R
16	6- 4		..	..	.	8 75	00	W	6	8 67	00	NW	2		215	225	L
17	"		..	..	.	7.	"	W	[illegible]	·67	"	NW	2		233	193	R
18	20- 3		..	..	.	63	− 21	SW	1	60	− 25	SW	1		199	218	L
19	"		..	..	.	·42	"	WSW	1	·5.	"	WSW	1		230	198	R
20	21- 3		..	..	.	24	00	SE	[illegible]	19	− 03	SE	3		204	220	L
21	"		..	..	.	24	"	W	1	16	"	W	1		232	228	R
22	12- 3		..	..	..	05	00	SE	0	·00	− 02	SE	0		200	210	L
23	"		..	..	.	05	"	SE	8	7 98	"	SE	8		227	195	R
24	9- 3		..	..	.	7 64	− 02	..	0	5.	00	..	0		214	220	L
25	"		..	..	.	62	"	..	0	·5.	"	..	0		235	203	R
26	8- 3		..	..	.	61	− 01	W	10	·51	− 04	SW	[illegible]		211	223	L
27	"		..	..	.	60	"	W	1	·50	"	NW	1		241	205	R
28	11- 3		..	..	.	60	− 01	..	0	·51	− 01	..	0		218	235	L
29	"		..	..	.	·59	"	..	[illegible]	50	"	..	[illegible]		233	205	R
30	7- "		..	..	.	61	00	SbW	[illegible]	50	00	S	6		213	223	L
31	"		..	..	.	·61	"	W	7	50	"	S	7		238	213	R

TABLES LXXXIII.—LXXXVI.

SILT AND EVAPORATION

Silt-Densities, -Velocities, and -Discharges, Series 261, 262,	Table	LXXXIII.
Silt-Densities and-Discharges, Roorkee Reach, . .	"	LXXXIV.
" " " Beira Reach, ...	"	LXXXV.
Evaporation at Soláni Aqueduct and Kamhera Sites,	"	LXXXVI.

Table LXXXIII. shows two SETS (Series 261, 262) of Silt-Densities on 9 verticals at the Soláni Right Aqueduct and Embankment Main Sites The Table is got up in pattern similar to those of Mean Velocity, (*see* explanation at page 67). No Velocity-work having been done along with the Silt-collections, the "Mean Results" of Mean Velocity Series Nos 111, 153, 164 have been brought forward for comparison of Mean Velocity with Silt Density on same vertical, and for computation of Silt-Velocities (*s*) and Silt Discharges (S)

Tables LXXXIV., LXXXV show the details of Silt Collections made on centre vertical and of those on various verticals forming Series 261, 262 above, with the Silt-Densities and Silt-Discharges corresponding Except in Series 261, 262 the Silt-Discharges (S) are only roughly approximate, being merely the products of the Central Silt-Densities (σ_c) by the Cubic Discharges.

No velocity-work was done along with the Silt-Collections of Table LXXXIV. so that the Cubic Discharges quoted are only interpolations from Tables XXXIV. to XL. The Silt-Collections of Table LXXXV were made either before or after the velocity work of Tables L., LI, so that the Cubic Discharges quoted are actual measurements.

The Quantity of water collected, and the Quantity *expected* (computed from the depth of water, H) are shown for every Silt-collection in Table LXXXIV The Difference (or "Loss") shows roughly the difficulty of handling the Silt-Tube, (some "Loss' being of course allowed for the spring bottom shutting before the Tube touched the Bed) On the rough bed of the Soláni Embankment the ' Quantity expected" is somewhat conjectural, being computed from the Average Depths, whilst the Silt-Tube was liable to close on touching any roughness on the Bed.

[In the above Tables the Silt-Density (σ) means the Density of aggregation of the Silt in the water, and is formed as the quotient—

Quantity of Silt collected — quantity of water in which it was contained,

and is measured in grains per cubic foot]

Table LXXXVI. shows the quantity (depth in inches) of Evaporation from the Canal Surface from 1876 to 1879 at the Soláni Aqueduct, and from January to March 1879 at the Kamhera Site Various meteorological data affecting evaporation, (such as Mean Temperature, Mean Humidity, Average Wind,) are given for the Soláni Experiments

TABLE LXXXIII.

SILT-DENSITIES, -VELOCITIES AND -DISCHARGES.

No. 261 AT SOLANÍ RIGHT AQUEDUCT; No. 262 AT SOLÁNI EMBANKMENT, MAIN SITE.

[*Instrument*—12′ × 2″ × 2″ *Silt-Tube*].

No velocity-work was done along with these silt-collections. The " Mean Results " of Mean Velocity Series Nos. 111, 153 154 have been brought forward for computation of Silt-Velocities and -Discharges.

SOLANI SITES.	Serial No.	1	2						6												7	8
		Date, 1877.	Depth.				Surface Breadth.	Area.	Mean Velocities (*u*), Silt Densities (σ), and Silt Velocities (*s*), past each vertical (N B —σ is measured in grains per cubic foot, and *s* in grains per second).												Cubic and Silt Discharge in c.ft., and lbs per sec	Mean Velocity, Mean Silt Density, Mean Silt Velocity.
			Above Datum.	Central	Solani Aqueduct Gauge.	Hyd Mean.			Description of line	Left of centre.					Centre	Right of centre.						
			h	H		R	*b*	A		42½	40	30	20	10		10	20	30	39½	42½	D, S	V, $\bar{\sigma}$, $\bar{s}$
RIGHT AQUEDUCT.	111	16 Sets	8·97	8·97	8·97	7·42	83·7	760·1	Rod-Velocities, (*u*),	?0	3·65	4·02	4·00	4·04	4·03	4·05	3·99	3·94	?3·43	?0	c. ft. 2,056	V = 3·88
	261	22-6-77	9·00	9·00	9·00	7·44	83·6	762·6	Silt-Densities, (σ) Silt-Velocities, (*s*),	? ?0	98·9 361	82·8 333	99·9 400	85·4 345	?40·4 ?163	94·7 384	99·9 399	87·7 346	87·8 ?301	? ?0	.. lbs 36·6	$\bar{\sigma}$ = 86·3 $\bar{s}$ = 335
		Date.	*h*	H		R	*b*	A	Description of line.	Edge	74½	60	40	20	Centre	20	40	60	74½	Edge	D, S	V, $\bar{\sigma}$, $\bar{s}$
MAIN SITE.	154 153	6 Sets 5 Sets	9·30	10·46	9·21	8·82	167·9	1651·1	Rod Velocities, (*u*),	?0	2·78	3·54	3·81	3·92	3·87	3·93	3·94	3·58	2·84	?0	c. ft. 6,049	V = 3·66
	262	19-7-77	9·20	10·44	9·10	8·73	168·7	1644·3	Silt-Densities, (σ). Silt-Velocities, (*s*),	? ?0	359 998	378 1,338	349 1,330	347 1,360	376 1,455	436 1,713	383 1,509	354 1,267	324 920	? ?0	.. lbs 317·6	$\bar{\sigma}$ = 370 $\bar{s}$ = 1,352

x

TABLE LXXXIV.

SILT-DENSITIES AND -DISCHARGES.

At Solání Twin Aqueduct and Embankment Main Sites.

[*Instrument*—*12′ Silt-Tube, 2″ diam*]

The Silt Discharges (S) Nos. 1 to 24 are only rough approximations, see Explanation, page 152.

SITES	Reference No	DATE, 1876-78	Position of vertical	DEPTH		QUANTITY OF WATER IN TUBE			SILT		CUBIC DISCHARGE Approximate	SILT DISCHARGE [Approx. in lbs. per sec.]	MEAN VELOCITY.
				at Gauge	on vertical of Experiment	corresponding to depth	actually collected	Loss	Actual [in grains]	DENSITY [in grs per c ft]			
				h	H	c in	c_1 in	c in		σ_0	D	S	V
SOLANI LEFT AQUEDUCT	1	16 12-'76	Central.	10 00	10 00	754 3	588 7	165 6	6 6	19 4	3,497	9 7	4 14
	2	21-12- ,,		00	00	754 3	650 7	103 6	15 7	41 8	3,497	20 9	4 14
	3	6-1-'77		9 60	9 60	724 1	675 2	48 9	22 9	58 8	3,218	27 0	3 96
	4	24 2- ,,		8 05	8·05	607 2	567 1	40 1	10 2	81 3	2,378	10 0	3 48
	5	3 3- ,,		30	30	313 0	285 1	27 9	1 5	9 4	2,478	3 3	3 51
	6	17-3- ,,		10	10	305 5	245 7	59 8	4 3	30 5	2 393	10 4	3 48
	7	9-5- ,,		75	·75	330 0	305 9	24 1	6 5	30 8	2,653	13 9	3 58
SOLANI RIGHT AQUEDUCT	8	17-4-'77	Central.	8 59	8 59	324 0	308	15 5	2 5	13·0	2,722	5 4	3 73
	9	28 4- ,,		9 48	9·48	357 5	346 6	10 9	4 9	24 7	3,140	11 1	3·91
	10	15 5- ,,		·63	63	363 2	344 9	18 3	5 2	20 4	3 240	12 2	3 98
	11	22 5- ,,		62	62	362 8	351 8	11 0	5 2	25	3,435	12 0	3 97
	12	30-5- ,,		10 00	10 00	377 1	362 6	14 5	6 7	31	3,401	15 5	4 02
	13	22 6- ,,		9 00	9 00	339 4	318 0	21 4	7 4	40 4	2,949	17 0	3 87
	14	22 8 ,,		68	68	365 1	350 9	14 2	56 8	280 4	3,262	180 5	3 98
	15	15-9- ,,		10 00	10 00	377 1	358 7	18 4	35 0	109 1	3,401	82 1	4 02
	16	22 9- ,,		10 00	10 00	377 1	360 5	16 0	24 3	117 0	3,401	56 9	4 02
	17	29 9- ,,		02	02	377 9	368 3	9 6	23 5	110 8	3,410	54 1	4 03
	18	6 10- ,,		00	00	377 1	352 7	24 4	13 4	65	3 401	32 0	4 02
	19	13 10- ,,		5 82	5 82	219 5	218 4	1 1	5 4	42 7	1,624	9 3	3 29
	20	20 10- ,,		3 80	3 80	143 3	129 5	13 8	4	5 1	842	6	2 62
	21	27-10 ,,		4 60	4 60	173 5	159 4	14 1	2	[illegible]	1 162	0	2 98
	22	13-11- ,,		8 97	8 97	338 3	323 2	15 1	7 1	38 1	2,941	16 0	3 86
	23	15 12- ,,		6 50	6 50	245 1	231 4	13 7	4 5	33	2 010	9 7	3 65
	24	16 1-'78		68	68	251 9	222 3	29 6	52 1	404	2,041	118 3	3 59
	25	22 6-'77	40 L	9 00	9 00	339 4	299 8	39 6	17 1	98 9	2,956	36 6	3 88
	26	,, ,,	30 L	,,	,,	,,	315 4	24 0	15 1	82 6			
	27	,, ,,	20 L	,,	,,	,,	313 7	25 7	18 1	99			
	28	,, ,,	10 L	,,	,,	,,	324 9	14 5	16 0	85 4			
	29	,, ,,	C	,,	,,	,,	318 0	21 4	17 4	40 4			
	30	,, ,,	10 R	,,	,,	,,	324 9	14 5	17 8	94 7			
	31	,, ,,	20 R	,,	,,	,,	322 3	17 1	18 6	99			
	32	,, ,,	30 R	,,	,,	,,	324 9	14 5	16 4	87 7			
	33	,, ,,	40 R	,,	,,	,,	324 5	14 9	16 4	87 5			
SOLANI EMBANKMENT MAIN SITE	34	19-7-'77	75 L	9 26	9 64	?363 6	351 8	?11 8	72 8	359	6,049	317 6	3 66
	35	,, ,,	60 L	,,	10 20	?384 7	375 2	?9 5	81 8	378			
	36	,, ,,	40 L	,,	68	?402 8	417 7	+ ?14 9	84 2	349			
	37	,, ,,	20 L	,,	64	?401 3	392 5	?8 5	78 6	347			
	38	,, ,,	C	,,	44	?393 7	367 4	?26	79 8	376			
	39	,, ,,	20 R	,,	11 00	?414 9	373 5	?41 4	94 0	436			
	40	,, ,,	40 R	,,	21	?422 8	376 1	?46 7	83 1	383			
	41	,, ,,	60 R	,,	10 90	?411 1	382 0	?28 1	78 3	354			
	42	,, ,,	75 R	,,	9 92	?373 1	357 9	?15 2	66 9	324			

TABLE LXXXV.

SILT-DENSITIES AND -DISCHARGES.

BELBA SITE.

[*Instrument—12′ Silt-Tube, 2″ diameter*]

These Silt-Collections were made just before or after the velocity work detailed in Tables L, LI.

The Silt-Discharge (S) is simply the product σ_0 D (reduced to lbs. per sec.)

Serial No	Date 1879	Depth at Gauge A	Depth Central H	Water collected c. in	Silt Actual (in grains)	Silt Density (in grs. per c. ft.) σ_0	Cubic Discharge (in cub. ft. per sec.) D	Silt Discharge (Approximate in lbs. per sec.) S	Mean Velocity V
201	27-3	7 54	9 89	329 3	16 4	86	5 432		
	9-1	50	63	318 4	13 0	71	5 751		
	11 1	44	57	353 5	19 1	93	5 765		
	17 3	29	48	342 3	201 8	1,025	5 367		
Range,		25	41	35 1	188 8	954	384		
Means of 4,		7 44	9 64	335 0	62 6	310	5,579		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	23 1	98	64	328 0	24 3	125	5 425	100·0	3 19
	,,	94	60	,,	,,	,,	5,301	97 7	3 13
Range,		26	48	57 2	504 5	2,918	282	2265 5	19
Means of 7		7 03	9 49	322 3	106 4	600	5 329	463 5	3 12
204.									
Range,		26	30	64 1	199 7	1,203	223	849 1	20
Means of 14		6 4?	8 71	305 1	51 4	301	4,810	211·0	3 01

Serial No	Date 1879	Depth at Gauge A	Depth Central H	Water collected c. in	Silt Actual (in grains)	Silt Density (in grs. per c. ft.) σ_0	Cubic Discharge (in cub. ft. per sec.) D	Silt Discharge (Approximate in lbs. per sec.) S	Mean Velocity V
		20	27	36 4	178 9	948	558	687 0	29
of 9		6 80	9 09	316 5	81 2	436	5,112	311 8	3·09
205	7 2	6 37	8 63	337 9	47 1	241	4,791	164 8	3·05
	30 1	33	63	338 7	9 1	66	4 745	44 7	3 06
	8 2	32	58	295 9	16·4	96	4 826	66 1	3 09
	4-2	28	·54	243 1	79 1	561	4 791	383·7	3·08
	10 2	27	51	330 1	20 6	108	4 724	72 9	3 05
	31 1	21	53	297 6	23 8	139	4,718	93 7	3·08
Range,		16	14	99 2	70 0	495	108	339 0	04
			8 57	290 0	32 7	202	4,766	137 7	3 07
			8 28	308 5	16 7	99	4 582	64 8	3 04
			15	274 7	12 8	81	4,121	47 7	2 79
			06	275 6	15 8	99	4 481	63 4	3·06
			11	284 2	20·9	127	4,361	79·1	2·97
			7 98	282·9	7 7	48	4 166	28·6	2 89
			98	291 1	28 7	171	4,218	103 8	2·94
			97	305 4	21 5	123	4 064	71 5	2 82
	15 2	72	96	270·8	34 3	210	4,160	130 1	2·88
Range,		30	32	46 4	379 8	5,185	518	3179 2	27
Means of 12,		5·84	8·10	287·5	100 5	601	4,292	309 5	2 92

TABLE LXXXVI.

EVAPORATION FROM GANGES CANAL

Roorkee and Kamhera Reaches

[*Instrument*—12" × 12" *Evapometer*]

(Time is reckoned from midnight right through the 24 hours.)

† The Thomason C. E. College is about one mile from the Solani Aqueduct Site.

SITES.	Experiment No	DURATION OF EXPERIMENT					AT THOMASON C. E. COLLEGE † ROORKEE.				AT THE EXPERIMENTAL SITE				
		From		To					WIND		Temperature of water			EVAPORATION (corrected for rain)	
		Date, 1876 79	Hour	Date 1876 79.	Hour	Total in days	Mean Temperature Fahr	Mean Humidity (Saturation = 100)	Prevailing Direction (Approximate)	Total (in miles per day)	Initial Fahr	Maximum Fahr	Rainfall (affect on the Exper!) Inch.	Total Inch	Mean per day. Inch.
SOLANI AQUEDUCT At Tail of Central Pier	1	28-11 76	8·30	7 12 76	8·30	9 0	56 9	57 0	W	58 5	Not observed	Not observed	None	1 26	14
	2	7 12. „	8 45	14-12. „	10·0	7 1	57 0	54 5	NW	35 7				72	10
	3	14-12 „	10 15	21 12 „	12 15	7 1	55 2	61 0	SE	53 6				65	03
		Pan broke away and lost.					.	..	.	..			..	..	..
	4	24 2 77	10·0	3-3-77	11·0	7 0	62 8	49 0	NW	84 0			None	96	14
	5	3 3 „	11 0	10-3- „	10 30	7 0	68 8	44 0	SE	50 5				43	·06
	6	21 3 „	6 5	29 3- „	9 45	8 2	69 6	46 5	NW	54 6				97	12
	7	15 5 „	7 30	22 5- „	7 30	7 0	85 9	25 0	NW	73 1				1 02	10
	8	19 6 „	5 15	26 6 „	7 30	7 1	94 9	23 5	NW	84 3		65°		84	12
		Rainy Season						.	..	..	..	..	..	..	..
	9	13 10-77	8 10	20 10 77	7 15	7 0	78 3	41 5	S	48 4	Not observed	Not observed	None	1 01	15
	10	2 11- „	9 30	12 11- ,	9 30	10 0	71 5	41 0	SE	35 8				1 27	13
	11	12 11 „	9 40	21 11 „	10 0	9·0	69 9	41 5	SE	34 5				1 20	13
	12	26-11 „	1 0	7 12 „	9·30	10·	61 7	59 5	NW	50 1				1 20	11
	13	19 12.	3 0	28 12 „	12 0	9 0	61 5	79 5	NW	60 8				+ 06	+ ·01
	14	14 1 78	12 0	24 1 78	15 0	10	56 4	68 0	NW	35 0				48	05
	15	28 1- „	10 0	2 2 „	14 0	5 2	54 1	70 5	NW	52 1				38	07
	16	5 3- ,	8 30	12-3 „	9 30	7 0	65 7	37 5	NW	60 8				1 20	11
	17	20-3- „	9 30	26 3- „	8 30	6·0	75 3	36 5	NW	31 6				85	13
	18	26 3 „	8 40	2 4 „	8 15	7 0	80 5	27 5	NW	85 3				94	13
	19	5-4- „	7 30	11-4 „	7 0	6 0	79 9	20 0	SE	42 9				1 72	29
	20	15 4 „	8 0	25-4 „	7 0	10·0	79 4	39 5	SE	40 1	62½°	?	005	1 27	13
	21	6-6- „	7·0	17 6- „	6 15	11·0	95 8	18 5	NW	94 9	67°	75½°	None.	1 32	12
		Rainy Season					.	..	.	.	..	..	..	..	.
	22	22 10-78	7 15	4-11 78	10 30	13 1	65 8	39 5	NW	46 1	63°	66°	None	64	·05
	23	4-11- „	10 30	20 11 „	12 0	16·1	65 8	34 5	NW	46 1	61°	64°		2 50	16
	24	22 11- ,	12 0	29-11 ,	12 30	7 0	63 4	45 5	SE	28 6	56½°	62°		45	06
	25	29-11 „	12 30	3 12- „	12 12	4 0	66 5	52 0	SE	53 9	57°	?	23	45	11
	26	3-12 „	13 30	14-12 „	15 0	11 1	60 8	50 5	NW	38 6	?	?	None	98	·09
	27	14 12 ,	15 10	25 12 „	13·0	10·9	55 2	40 5	SE	38 2	?	?		1 12	10
	28	10-4 79	7·0	23-4 79	7 0	18·0	84 5	13 5	NW	62 5	?	?		2 95	16
KAMHERA SITE About 50 below Experl Site	29	6-1 79	16·0	13 1 79	13·0	6·9	No Meteorological Observatory near this Site, which is 33 miles from Roorkee, *see* Plate III.				Not observed	Not observed	Evapometer placed under shelter during rain	45	07
	30	13 1- „	13 0	18-1- „	14 0	5·0								57	11
	31	18-1 „	14 0	25 1 ,	10 20	6·5								1·07	15
	32	25-1 ,	10-30	4-2 „	15 0	10·2								1 95	19
	33	4 2- „	15 0	11 2 „	15 0	7·0								1 25	18
	34	11 2 „	15·0	15 2 „	16·0	4·0								·85	21
	35	15 2- „	16 0	25 2 „	15 0	10·0								35	04
	36	25-2 „	15·0	4-3 „	12 0	6·9								1 45	21
	37	4-3- „	12·0	11-3- „	12·0	7·0								1 60	23
	38	11-3- „	12·0	18-3 „	11 0	7·0								·60	09
	39	18 3- „	11·0	25-3- „	12 0	7·0								2 60	37
	40	25-3- „	11 30	27 3- „	11 30	2 0								45	23

PART II.

ABSTRACT TABLES.

TABLES 1—34.

PART II.—ABSTRACT TABLES.

Tables 1—34.

These Tables contain an Abstract of the principal Results (chiefly "Means" and "Ranges") from the Detailed Tables (VII.—LXX.) preceding, together with additional Results (mostly computed, not experimental details). They bear separate numbering in black letter Arabic numerals (1—34), and separate pagination A Table of Contents follows.

Reference to these Abstract Tables will be sufficient for most purposes, and so save reference to the Detailed Tables

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2	4, 5	Double-Floats of Modern Experiments.
3, 4	6-9	Vertical Velocity-Curves—Abstract of Results.
3, 4	6-8	—— Central Verticals, Series 1-28.
4	9	—— Non-Central Verticals, " 29-46.
5	10	Most Probable Parabola. Coeff of A, B, C. of v_1 in L, M, N, of L, M, N,
"	"	—— Weights and Square Roots of Weights of A, B, C.
6	11	Depression of Maximum Velocity Line, Central Vertical, Series 1-26.
7	12	Parameter-Variation, Central Vertical Velocity-Parabolæ, " " "
8	13	Mean Velocity past Central Vertical, Variation, " " "
9	14	Rod-Motion, Comparison ! Soláni Twin Aqueducts, Central Vertical.
10	15	Effect of Depth on Velocity. Velocities over top steps of Soláni Embankment.
11	16, 17	Transverse Velocity Curves Float-Course Spacings and Area and Discharge-Formulæ
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20	26, 27	—— Series 101-107; 108-127; 131-139.
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23	32	Cubic Discharge Table. Roorkee, Belra, and Kamhera Reaches, and 4 Distributaries.
24-31	33-45	Cubic Discharge Verification.
24	33	—— Range of Mean Velocities in each Series. Series 101-238.
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29	41	—— " " " Comparison Nos 7—16.
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ABSTRACT TABLE 1.

EFFECT OF CONTROL ON SURFACE-FALL

This Table is an Abstract of the Results required for Plates VIII IX, together with additional data.

SITES.	Serial No	Number of Sets	CONTROL.					GAUGE-READINGS						SURFACE-FALL.					[Bank]
			Head of Reach			Tail of Reach		Head Gauge of Reach.	Experimental Sites				Tail Gauge of Reach	Sub-Reaches			Whole Reach.	Surface Slope	
			Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries	Average Obstruction		15th Mile	Embankment, Main Site	Solani Aqueduct	Jaoli Site		Upper Sub-Reach	Middle Sub-Reach	Lower Sub-Reach			
						Q	k							F_1	F_2	F_3	F	S	
SOLANI AQUEDUCTS, Left	106	6	0	½	0	23	00	7·30	Not observed.	Not observed	8·02	Not observed	3·55	5·88	No middle Sub Reach	4·27	10·15	?206	Left
SOLANI AQUEDUCTS, Right [Left Aqueduct open]	112	15	0	0	0	116	00	7·81			3·58		3·67	5·80		4·71	10·56	?	Right
	113	1	0	0	0	0	00	7·40			8·16		3·60	5·84		4·36	10·20	228	
	116	7	0	0	0	41	13	6·84			7·49		3·51	5·05		3·79	9·74	?207	
	120	9	0	0	0	144	1·04	5·07			5·78		3·38	5·89		2·20	8·09	?	
	125	1	3	0	10	0	00	5·20			2·02		1·40	7·78		42	8·20	203	
	127	1	16	0	10	0	50	1·50			70		7·50	7·40		7·00	?7·40	113	
SOLANI AQUEDUCTS, Right [L Aq closed]	131	2	0	0	0	247	?4·30	1·60			4·60		4·30	3·60		10	3·70	025	Right
	133	1	0	0	0	162	3·08	1·35			3·60		3·40	4·35		00	4·35	?	
	136	1	0	0	8	71	1·33	2·80			3·12		3·30	6·28		62	8·90	208	
	139	2	0	0	8	50	1·21	2·00			3·66		3·30	5·95		16	6·11	151	
SOLANI EMBANKMENT, MAIN SITE	22	16	1/16	0	0	24	33	5·97	Not observed	6·76	6·55		3·30	4·64	1·38	3·05	9·07	?	
SOLANI EMBANKMENT, MAIN SITE, High Water	151	5	0	0	0	268	00	9·21		9·94	9·87	Not observed	4·21	4·70	1·25	5·46	11·41	227	Left
	154	5	0	0	0	243	00	8·36		9·08	8·94		3·91	4·71	1·39	4·83	10·86	?229	
	155	6	0	0	0	104	00	8·03		8·74	8·65		3·81	4·72	1·26	4·65	10·63	217	
	160	6	0	0	0	15	00	6·29		7·06	6·91		3·20	4·67	1·32	3·52	9·51	214	
	161	11	0	0	0	16	00	6·07		6·82	6·72		3·13	4·08	1·27	3·39	9·34	?217	
	164	1	0	0	0	0	6	5·10		5·24	?4·69		3·00	5·29	1·72	2·49	9·50	?	
SOLANI EMBANKMENT, MAIN SITE, Low Water	166	1	0	0	0	147	2·6"	3·00		3·98	4·50		3·70	4·45	65	60	5·70	?	Left
	171	3	0	0	0	258	?4·30	1·53		3·62	4·55		4·30	3·65	24	·05	3·94	?038	
	172	2	0	0	0	246	?4·50	1·55		3·58	4·55		4·30	3·41	20	05	3·66	?	
	173	5	0	0	8	232	2·05	2·33		3·47	4·23		3·95	4·29	41	·09	4·79	088	
	176	2	4½	0	8	104	1·76	2·43		2·83	3·30		2·80	5·03	70	30	6·03	?242	
	176	2	0	0	0	82	2·61	1·35		2·43	3·28		2·90	4·36	32	18	4·86	?	
	180	2	0	0	9	19	1·24	1·80		1·67	2·50		2·00	5·72	39	10	6·21	148	
	161	1	13	0	10	0	67	2·50		35	93		?·67	7·58	39	?·06	?8·23	000	
15TH MILE, Old Site	191	1	0	0	0	123	00	9·30	15·31	Not observed	9·99	Not observed	4·25	2·28	3·63	5·54	11·45	240	Left
	192	6	0	0	0	44	·00	8·29	14·32		8·98		3·92	2·06	3·65	4·87	10·78	231	
	193	3	0	0	0	80	00	8·00	13·99		8·70		3·7	2·30	3·60	4·73	10·63	227	
	194	2	0	0	0	0	00	7·58	13·60		8·35		3·65	2·27	3·66	4·40	10·33	231	
	195	1	0	0	0	62	00	6·30	12·53		7·05		3·20	2·06	3·75	3·65	9·50	?	
15TH MILE, New Site	196	2	0	0	0	265	00	9·13	15·16		9·83		4·20	2·26	3·65	5·37	11·28	?221	Both
	197	1	0	0	7	115	00	8·60	14·69		9·35		3·95	2·19	3·66	5·20	11·05	220	
JAOLI	211	2	No Dam in this Reach		No Bays closed	53	?·00	6·35	Not required.	Not required	Not required	7·21	?3·35	·39	No middle Sub Reach	?5·49	5·88	?174	Both
	212	6				43	00	5·79				6·71	3·2	·37		5·14	5·46	160	
	213	7				52	29	5·50				6·45	3·35	·29		4·80	5·09	?148	
	214	2				35	00	5·25				6·21	3·16	·28		4·70	4·98	146	
	215	10				47	20	4·98				5·97	3·09	·25		4·53	4·78	145	
	216	9				44	44	4·67				5·64	3·09	·27		4·19	4·46	144	
	217	6				16	67	4·33				5·56	3·25	·21		3·76	3·97	140	

DOUBLE-FLOATS OF

EXPERIMENTS	Reference to original	Double Float		Maximum Immersion
	Page	Name of part.	Description	
MISSISSIPPI, 1851 53	224	Surf Float,		
	224 114*	Connector		
*Chief of Engineers Report for 1873.	224	Sub Float,		
MISSISSIPPI, 1858 (under ½ depth)	224	Surf. Float 1°	Light pine, 5½" × 5½" × ½",	7¾"
		Surf. Float 2°	Hollow tin ellipsoid, 5½" × 1½",	7¾"
	,,	Connector,	Cord $\frac{1}{16}$" thick,	5
	,,	Sub Float,	Paint keg, 9" × 6" diam, (ends removed),	
MISSISSIPPI, 1858 (over ½ depth)	224	Surf Float 1°	Light pine, 5½" × 5½" × ½",	7¾"
		Surf Float 2°	Hollow tin ellipsoid, 5½" × 1½",	7¾"
	,,	Connector,	Cord < $\frac{1}{16}$" thick,	70
	,,	Sub Float,	Keg, 12" × 8" diam, (ends removed,)	
MISSISSIPPI, 1859	252	Surf. Float,	Cork disc, 2" diam × ½",	½"
	,,	Connector,	Fine wire, (size not stated),	6
	,,	Sub-Float,	Cross (+) of 4 strips of tin 4" × 2" on edge, with cork disc 2" diam × ½",	
CONNECTICUT 1871 74.	48	Surf Float,		7½"
	,,	Connector,		22
	,,	Sub-Float,	and 7½"	
IRRAWADDI, 1872	16 & 17	Surf Float,	Light wood disc, 6" diam × 1",	¾"
		Connector,	Cord, $\frac{1}{16}$" thick, varnished,	70
		Sub Float,	Wood-cylinder, 12" × 6" diam, loaded below,	
ROORKEE, 1875	54*	Surf. Float,	Cork disc, 1" diam. × ¼",	¼"
	,,	Connector,	Black silk thread, about $\frac{1}{25}$" thick,	6
* Report of 874-5.	,,	Sub-Float,	Cross (+) of 2 sheets tin discs 3" diam, on edge with cork disc 1" diam. × ½" thick,	
ROORKEE, 1875-6.	Chapter on Double Floats	Surf Float,	Pine disc 3" diam × ½"	¼"
		Connector	Brass wire No. 30 B W G = ·012" thick,	10
		Sub-Float,	Heavy wood ball 3" diam., loaded,	
ROORKEE, 1876-79		Surf. Float,	Cork disc, 1" diam. × ¼".	$\frac{3}{16}$"
		Connector 1°	Black silk thread, $\frac{1}{125}$" thick (in 1876-78),	10
		Connector 2°	Black silk thread, $\frac{1}{25}$" thick, (from May 78 only a few cases)	10
		Sub-Float,	Hollow shell of thin sheet copper, 1½" diam, loaded below,	

ABSTRACT TABLE 2.

MODERN EXPERIMENTS.

Weight.	Reserve Buoyancy.	Tension of Connector.	Area of Surfaces in square inches: exposed to direct current-pressure.	Area of Surfaces in square inches: exposed to lateral current-adhesion	Relative Surface. (Sub-Float=1). Direct.	Relative Surface. (Sub-Float=1). Lateral.
?	?	..	(8"×√2)×1·5" .. = 17	2×17+8"×8" .. .. = 98	11	33
?	..	?	$\frac{2}{10}$"×(100×12)". = 240	2×240 .. .. .. = 480	1·60	1·60
8 1 oz.	..	?	$\frac{1}{10}$"×(100×12)" .. = 120	2×120 .. .. .. = 240	80	80
130 oz	..	..	15"×10" .. .. = 150	2×150+ ? (for edges) = 300+	1	1
?	?	..	(5·5"×√2)×⅜" .. = 2·92	2×2·92+5·5"×5·5" .. = 36·1	05	33
?	?	..	½×¼π×5·5"×1·5" = 3·25	2×3·25+¼π×5·5"×5·5" = 30·3	06	28
?	..	?	$\frac{1}{10}$"×(5×12)" .. = 6	2×6 .. .. . = 12	11	·11
?	..	..	9"×6" .. .. = 54	2×54+ ? (for edges) .. = 108+	1	1
?	?	..	(5·5"×√2)×⅜" .. = 2·92	2×2·92+5·5"×5·5" .. = 36·1	·03	19
?	?	..	½×¼π×5·5"×1·5" = 3·25	2×3·25+¼π×5·5"×5·5" = 30·3	·03	16
?	..	?	$\frac{2}{10}$"×(70×12)" .. = 168	2×168 .. .. .. = 336	1·75	1·75
?	..	..	12"×8" .. .. = 96	2×96+ ? (for edges) .. = 192+	1	1
?	?	..	2"×⅛" .. .. = 25	2×·25+¼π×2"×2" .. = 3·64	01	03
?	..	?	? .. = ?	? + ? .. .. = ?	?	?
?	..	..	8"×2"+2"×½" .. = 17	2×17+2×¼π×2"×2" = 40·3	1	1
4 oz.	11 oz	..	½×¼π×6"×1·5" .. = 3·5	2×3·5+¼π×6"×6" .. = 35·3	·03	21
?	..	8 oz.	·036"×(22×12)" = 9·5	2×9·5 .. .. .. = 19	13	11
90 oz.	..	..	8·5"×8·5" .. .. = 72·25	2×72·25+2×¼π×(8·5"+7·5")×1" .. = 169·6	1	1
4 1 oz	4 1 oz	..	6"×¾" .. .. = 4·5	2×4·5+¼π×6"×6" .. = 37·3	06	19
?	..	8 2 oz.	$\frac{1}{16}$"×(70×12)" .. = 52·5	2×52·5 .. .. .. = 105	73	52
204 5 oz	..	..	12"×6" .. .. = 72	2×72+2×¼π×6"×6" = 200·5	1	1
?	?	..	1"×⅛" .. .. = ·125	2×·125+¼π×1"×1" = 1·04	·02	·07
?	..	?	⅛"×(6×12)" .. = 9	2×9 .. .. . = 18	13	11
?	..	..	¼π×3"×3" .. = 7·1	2×7·1+2×¼π×1"×1" = 15·8	1	1
?	?	..	3"×¼" .. .. = ·75	2×·75+¼π×3"×3" .. = 8·6	11	30
24 gr	..	?	·012"×(10×12)" = 1·44	2×1·44 . .. .. = 2·88	20	10
?	..	..	¼π×3"×3" .. = 7·1	4×7·1 .. .. .. = 28·4	1	1
?	6 gr. to 15 gr	..	1"×$\frac{3}{16}$" .. .. = ·2	2×·2+¼π×1"×1" .. = 1·19	10	14
?	?	30 gr	$\frac{1}{120}$"×(10×12)" .. = 1·0	2×1·0 .. .. .. = 2·0	48	·24
?	?	30 gr	$\frac{1}{80}$"×(10×12)" .. = 1·5	2×1·5 .. .. .. = 3·0	·72	36
540 gr	..	..	¼π×1⅝"×1⅝" .. = 2·07	4×2·07 .. .. .. = 8·3	1	1

ABSTRACT TABLE 3.

VERTICAL VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract from the Detailed Tables VII—XV., with additional Results

Two lines are devoted to each Series The Mean Results are shown throughout the Ranges are shown in second line of sub Col. H and of Cols 3 6 8 and Probable Errors in second line of Col 11

SITES.	1		2				3		4		6		8					9				10					11			
			SUB FLOAT		ROD		SURFACE FALL		AVERAGE WIND				MEAN VELOCITY past the vertical					DIFFERENCES.				RATIOS					PARABOLIC ELEMENTS			
													Approximations																	
	Position of Vertical	Serial No	Number of Sets Wood (w) Copper (c)	Longest Connector	Number of Sets Wood (w) Tin (T) Length	Average Depth in Float Course	Upper Sub-Reach	Lower Sub Reach	Direction	Velocity	Surface Velocity	Bed Velocity	Discharge / Depth	Mid-depth Velocity	By ⅓ depth Velocity	Rod Velocity										Depth of max velocity	Z — H	Max velocity	Parameter
						H	F_1	F_2			v_0	v_B	U	$v_{\frac{1}{2}d}$	v_m	v	$(U - v_0)$	$(v_{\frac{1}{2}d} - U)$	$(v_m - U)$	$(v - U)$	$U - v_0$	$U - v_{\frac{1}{2}d}$	$U - v_m$	$U - v$	$v_B - v_0$	Z	ζ	V	p
SOLANI LEFT AQUEDUCT	CENTRAL	1	20 w	9	20 w 9	9 46 25	5 67 15	5 20 30	swbw	2	4 25 28	3 51 68	3 99 16	4·04 40	3 98 ?	3 77 55	− 26	+ 05	− 01	− 22	939	938	1 002	1 058	826	36 31	038	4 25 01	102 4 8 2
		2	22 w	8	None	8 90 05	5 71 05	4 86 05	sebe	1	4 34 58	3 57 55	4 11 21	4 21 25	4 13 ?	?	− 23	+ 10	+ 02	?	·947	976	995	?	823	1 30 19	145	4 35 01	69 7 3 6
		3	12 w	6	12 w 6	7 25 00	5 85 00	3 83 05	s	3	3 82 34	3 27 67	3 61 21	3 65 24	3 51 ?	3 56 39	− 19	+ 02	− 06	− 07	950	995	1 017	1 020	856	1 04 51	143	3 86 03	42 2 7 6
		4	4 w	5	4 w 5	5 92 05	5 88 05	2 57 05	s	15	3 47 07	3 03 35	3 32 10	3 39 20	3 25 ?	3 32 33	− 15	+ 07	− 07	00	957	979	1 022	1 000	878	1 15 44	194	3 53 04	27 7 4 9

SOLANI RIGHT AQUEDUCT Left Aqueduct open	CENTRAL	5	16 c 10	16 T 9½	9 94 22	5 98 10	5 45 17	NEbE 2	4 58 83	4 42 46	4 61 10	4 62 42	4 58 ?	4 3 37	+ 03	+ 01	– 03	– 30	1 007	998	007	1 070	965	3 23 75	325	4 72 05	89 3 13 2
		6	16 c 9	13 T 9 3 T 8½	9 41 21	5 84 10	5 23 33	NEbE 4	4 23 87	4 2 51	4 27 18	4 32 34	4 22 ?	4 08 47	+ 04	+ 05	– 05	– 19	1 009	988	1 012	1 047	986	3 08 70	327	4 37 05	89 5 12 6
		7	18 c 8	18 T 8	8 85 15	5 80 10	4 80 15	s b W 5	4 07 87	3 63 55	4 00 23	4 07 38	4 00 ?	3 85 29	– 07	+ 07	00	– 15	983	983	1·000	1·039	892	2 34 1 43	264	4 13 04	79 2 47 8
		8	16 c 8	16 T 8	8 42 23	5 82 05	4 62 23	NEbN 2	4 03 42	3 69 61	3 95 20	4 02 40	3 92 ?	3 77 22	– 08	+ 07	– 03	– 18	980	983	1 008	1 048	916	1 78 49	211	4 10 03	79 5 9 9
		9	14 c 8	12 T 8 2 T 7½	8 32 21	5 98 69	4 53 61	s b W 2	4 29 98	3 98 96	4 37 73	4 25 84	4 26 ?	3 98 72	+ 04	– 07	– 06	– 31	1 009	1 016	1 014	1 085	930	2 22 77	207	4 38 05	75 0 13 9
		10	2 c 8	2 T 7	8 13 06	6 02 06	4 43 06	SE 1	4 47 17	4 05 36	4 41 08	4 51 08	4 40 ?	4 03 04	– 06	+ 10	– 01	– 33	987	978	1 002	1 094	906	?	?	?	?
		11	15 c 7	15 T 7	7 75 16	5 86 09	4 23 15	W 2	4 0 37	3 68 52	3 99 24	4 06 33	4 00 ?	3 79 24	– 06	+ 07	+ 01	– 20	985	983	998	1 053	909	2 04 43	263	4 11 03	62 0 7 2
		12	0 W 7	20 W 7	7 59 10	5 81 10	4 00 10	s b E 2	3 80 44	2 98 54	3 65 22	3 71 45	3 64 ?	3 57 57	– 15	+ 06	– 01	– 08	961	984	1 003	1 022	784	1 48 20	195	8 85 02	48 0 3 6
		13	4 c 7	4 T 6	7 15 06	6 06 06	3 86 00	Calm	4 05 40	3 63 15	3 99 11	4 06 15	4 01 ?	3 86 04	– 06	+ 07	+ 02	– 13	985	983	995	1 034	896	1 89 37	264	4 18 03	49 1 5 0
		14	3 c 6 13 c 7	10 T 6	6 77 30	5·06 03	3 19 52	s / W 3	3 86 75	3 61 51	3 91 29	3 95 28	3 85 ?	3 77 40	+ 05	+ 04	– 00	14	1 013	990	1 016	1 037	935	2 27 62	335	4 08 07	86 4 6 4
		15	9 c 6	3 T 5½ 6 T 6	6 22 10	6 15 30	2 62 50	N 8	4 09 61	3 77 47	4 03 33	4 0 42	4 00 ?	3 77 28	– 00	+ 07	– 03	– 26	985	983	1 008	1 060	922	1 60 38	257	4 16 03	42 2 5 2
		18	16 c 5	16 T 5	6 01 05	6·37 28	2 81 05	S 4	3 98 32	3 56 50	3 89 12	3 92 23	3 86 ?	3 82 13	– 09	+ 03	– 03	07	977	992	1 008	1 018	894	1 33 35	221	4 14 03	33 7 4 6
		17	3 c 5	3 T 5	6 55 0	6 35 0	3 05 0	S 6	3 74 07	3 2 13	3 66 07	3 76 13	3 65 ?	3 60 07	– 08	+ 10	– 01	– 06	979	978	1 003	1 017	874	1 38 55	240	3 83 06	27 4 5 7
(L Aq closed)	CENTRAL	18	4 c 4	4 T 4	4 66 15	6 40 15	1 66 15	NWbN 6	6 43 1 18	6 14 72	6 40 27	6 43 14	6 39 ?	6 32 20	– 03	+ 03	– 01	– 08	995	995	1 002	1 013	955	1 23 51	264	6 49 04	30 1 7 1
		10	8 c 3	8 T 3	4 21 26	6 39 26	1 21 26	SW 2	6 05 72	5 61 65	5 85 35	5 85 69	5 84 ?	5 82 50	– 20	00	– 01	– 03	967	1 000	1 002	1 005	927	$\bar{6}$ 17 00	$\bar{1}$ 47	6 29 00	155 5 0
		20	10 c 3	10 T 3	3 9 21	6 61 21	93 21	SW 8	5 65 94	5 11 1 00	5 47 53	5 50 58	5 44 ?	5 50 36	– 18	+ 04	– 03	+ 03	968	995	1 006	995	904	37 15	093	5 66 01	18 7 2 0

ABSTRACT TABLE 4.

VERTICAL VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract from the Detailed Tables XVI—XXVIII., with additional Results.

Two lines are devoted to each Series. The "Mean Results" are shown throughout; the "Ranges" are shown in second line of Sub Col H, and of Cols 3, 6, 8; and "Probable Errors" in second line of Col. 11

	1		2			3			4		6		8				9				10					11			
			Sup-float	Rod		Fall of Water-Surface			Average Wind				Mean Velocity past the vertical				Differences				Ratios.					Parabolic Elements.			
														Approximations															
Sites.	Position of Vertical	Serial No	Number of Sets. Wood (W), Copper (C). Longest Connector	Number of Sets. Wood (W), Tin (T). Length	Average Depth in Float-Course. H	Upper Sub-Reach v_1	Middle Sub-Reach v_2	Lower Sub-Reach v_3	Direction.	Velocity	Surface Velocity v_0	Bed Velocity v_B	Discharge Depth U	Mid depth Velocity $v_{\frac{1}{2}}$	By ½-depth Velocity v_m	Rod Velocity u	$(U - v_0)$	$(v_{\frac{1}{2}} - U)$	$(v_m - U)$	$(u - U)$	$U \div v_0$	$U \div v_{\frac{1}{2}}$	$U \div v_m$	$U \div u$	$v_B \div v_0$	Depth of max velocity Z	Z — H. ζ	Max velocity. V	Parameter p
SOLANI EMBANKMENT, MAIN SITE	CENTRAL	21	10 C 10	14 T 9 2 T 0½	10·83 ·26	4 77 04	1 19 07	5·33 ·22	E	4	4 39 54	4·08 ·73	4 27 32	4 26 48	4 24 7	3 97 05	− 12	− 01	− 03	− 30	·978	1·002	1·007	1 076	·929	·27 1 29	025	4 44 ·02	206 5 61·8
		22	5 C 7 11 C 8	14 T 7 2 T 7½	7 93 25	4 61 ·43	1 38 22	3·00 75	SSE	4	3 48 ·31	3 36 ·71	3 41 20	3 55 41	3 43 7	3 39 22	− 01	+ 08	− ·03	− ·18	997	·977	1·016	1 055	937	2 28 ·51	288	3 61 04	50 9 0 8
		23	10 C 6	10 T 0	7 71 ·03	5 21 03	1 15 00	3 34 03	Calm		4 16 30	3 50 ·70	4·07 23	4 09 33	4 10 7	4 00 ·20	− 19	+ 02	+ 03	− 07	955	995	·993	1 018	·822	49 ·98	·003	4 23 03	73 1 28 8
		24	6 C 7	4 T 6½ 2 T 7	7 35 ·11	4 63 09	1 41 04	2 81 22	W	5	3 39 34	2 88 32	3 26 ·18	3 29 16	3 24 7	3 14 ·18	− ·13	+ 03	− 02	− ·12	·962	·991	1 006	1·038	860	1 00 48	·143	3 13 02	61 2 0 0
		25	12 C 6	12 T 6	7 20 11	5 22 14	1 23 01	3 02 ·10	NNE	4	3 88 ·44	3 34 70	3 74 31	3 81 44	3 74 ?	3 53 ·43	− 11	+ ·07	00	− 21	961	·982	1·000	1·059	·861	1 29 29	·178	3 92 ·02	54 6 5 4
		26	7 C 5	7 T 5	6 50 06	4 80 06	91 00	1 36 06	S	7	2 91 17	2 50 87	2 85 12	2 88 14	2 81 7	2 82 ·12	− 08	+ ·03	− ·04	− 03	979	·990	1 014	1 011	859	1·58 ·58	213	3 02 06	30 5 0 5
		27	10 C 5	16 T 5	6 24 07	5·02 ·07	4 12 00	2 41 ·07	N	2	3 34 ·32	2 86 87	3 21 21	3 26 39	3 21 ··	3 11 ·10	− 13	+ 03	− ·00	− ·10	·961	985	1 000	1 032	850	1 09 19	·175	3 37 ·01	45 9 3 5
		28	10 C 5	16 T 5	6 10 24	4 70 ·09	·91 ·01	1 12 08	E	5	2 84 ·37	2 24 55	2 63 19	2 67 32	2 62 ··	2 59 ·32	− ·21	+ ·04	− 01	− ·04	·920	985	1 004	1 016	789	−·13 00	− 021	2 81 ·00	62 7 0

SOLANI FLIGHT AQUEDUCT	41⅞L	29	16 c 8	16 T 8	8 39 22	5 80 18	No middle Sub Reach	4 35 25	SSW	2	2 34 54	2 44 59	2 61 33	2 70 38	2 57 ?	2 8 23	+ 29	+ 07	− 06	+ 18	1 124	974	1 023	930	1 043	4 65 1 17	554	2 70 12	69 4 13 9
	41⅞L	30	5 c 7	5 T 7	6 96 20	5 80 07		3 94 15	N	1	2 42 26	2 54 ·58	2 75 12	2 8 18	2 70 ?	2 92 27	+ 31	+ 08	− 03	+ 19	1 128	972	1 011	935	1 000	3 47 93	499	2·83 15	32 4 6 9
	41¼L	31	16 c 8	16 T 8	8 45 23	5 79 10		4 59 30	S	7	2 2 44	2 61 76	2 9 20	3 00 27	2 92 ?	2 97 35	+ 19	+ 09	+ ·01	+ 06	1 070	970	997	980	960	4 12 63	468	3 01 06	63 5 7 4
	40L	32	2 W 14 c 8	16 W 8	8 64 15	5 81 10		4 73 05	S	1	3 07 54	99 39	3 28 23	3 37 24	3 27 ?	3 37 36	+ 21	+ 09	− 01	+ 09	1 068	973	1 000	973	974	3 95 25	457	3 40 03	47 7 2·3
	40L	33	16 c 8	5 W 8 11 T 8	8 62 20	5 86 10		4·64 28	SSW	3	3 14 70	3 29 1 15	3 40 42	3 44 37	3 36 ?	3 42 43	+ 26	+ 04	− 04	+ 02	1 083	988	1 012	994	1 048	4·38 67	·508	3 49 08	56 6 6 8
	37½I	34	16 W 9	16 W 9	9 42 20	5 80 10		5 24 15	S	4	3 52 49	3 21 53	3 68 14	3 83 35	3 64 ?	3 68 26	+ 16	+ 15	− 04	00	1 045	961	1 011	1 001	912	3 69 25	392	3 87 04	42 3 2 0
	30L	35	4 W 9	4 W 9	9 5 23	5 79 10		5 37 18	WSW	7	4 16 26	3 60 53	4 10 25	4 15 21	4 09 ?	3 92 45	− 00	+ 05	− 01	18	986	988	1 002	1 046	865	2 57 78	269	4 28 06	67 1 11 1
	30L	36	15 W 9	15 W 9	9 33 18	5 81 10		5 20 10	SWbS	3	4 1 45	3 69 86	4 04 40	4 10 46	4 03 ?	3 95 43	09	+ 06	− 01	− 09	978	985	1 002	1 023	893	2 23 49	230	4 23 03	67 8 7 3
	30L	37	18 W 9	18 W 9	9 01 15	5 84 12		4 98 15	SbW	3	4 12 34	3 58 24	3 96 17	4 03 35	3 91 ?	3 79 29	− 16	+ 07	05	− 21	961	993	1·013	1 056	860	1 78 31	142	4 14 01	87 0 7 3
	30R	38	12 W 9	12 W 9	9 17 18	5 84 30		5 12 13	S	4	3 13 55	33 39	3 73 22	3 87 23	3 71 ?	3 63 42	+ 10	+ 14	− 02	− 10	1 078	964	1 005	1 028	917	3 01 23	·304	3 87 03	53 1 2 3
	30R	39	4 W 9	4 W 9	8 8 00	5 85 00		4 9 00	SWbS	7	3 93 34	3 45 16	3 85 00	3 96 11	3 87 ?	3 66 04	06	+ 11	+ 02	− 19	980	972	995	1·052	876	2 55 48	288	4 00 03	68 8 7 6
	37½R	40	16 W 8	16 W 8	8 68 20	5 80 20		4 74 25	S	3	3 13 34	2 93 60	3 27 13	3 39 31	3 25 ?	3 36 29	+ 14	+ 12	− 02	+ 09	1 044	965	1·006	973	933	3 41 36	393	3·42 05	43 8 3 2
SOLANI EMBANKMENT MAIN SITE	79½L	41	16 c 2	16 T 2¼	2 55 11	4 58 02	1 20 04	4 84 09	WbS	5	2 54 39	2 65	2 40 31	2 43 42	2 39 ?	2 32 38	− 14	+ 02	− 01	− 08	945	997	1·004	1 034	854	− 14 00	·054	2 54 00	18 2 0
	75½L	42	16 c 5	3 T 5 13 T 5½	5 60 26	4 86 48	1 17 20	5 22 22	SEbE	0	3 40 51	3 03 1 16	3 29 43	3 32 63	3 28 ?	3 01 48	− 11	+ 03	− 01	− 28	968	991	1 003	1 093	891	·61 63	109	3 42 02	56 8 15 6
	75½L	43	16 c 3	6 T 3 10 T 3¼	3 61 31	4 61 11	1 37 03	3 8 20	SbE	3	2 66 43	2 23 73	2 5 29	2 55 26	2 51 ?	2 38 31	− 15	+ 04	00	− 13	944	984	1 000	1 055	838	− 17 26	·047	2 66 01	33 3 6 3
	74½L	44	5 c 8	5 T 8	8 76 25	4 61 14	1 22 09	4 41 1 13	NEbN		2 83 40	2 26 27	2 53 05	2 43 11	2 50 ?	2 36 12	− 30	− 11	− 03	− 1	894	1 045	1·012	1 072	799	54 38	?	2 83 02	28 9 5 8
	74½L	45	6 c 8	6 T 8	8 4 19	4 59 09	1 22 06	4 30 13	WNW	4	2 70 17	2 2 53	2 49 14	2 43 ·08	2 44 ?	2 39 09	− 21	− 06	− 05	− 10	922	1·025	1 020	1 042	841	61 38	?	2 71 01	50·0 10 1
	74½L	46	8 c 8	8 T 8	8·1 18	4 61 05	1·27 11	4 12 15	NNW	1	2 63 23	2 8 43	2 40 15	2 40 40	2 35 ?	2 3 18	− 23	00	− 05	− 09	913	1·000	1·071	1 039	829	− 76 47	?	2 64 01	73·7 21 9

MOST PROBABLE PARABOLA.

Co-efficients of A, B, C; of v_x in values of L, M, N, of L, M, N, Weights of A, B, C, &c.

Co-efficient Symbol.	Value of Co-efficients of A, B, C.								Equation of Parabola.
	$n=3$	$n=4$	$n=5$	$n=6$	$n=7$	$n=8$	$n=9$	$n=10$	
$\Sigma_0^n (n+1-x)$,	10	15	21	28	36	45	55	66	
$\Sigma_0^n (\overline{n+1-x}\,.\,x)$,	10	20	35	56	84	120	165	220	
$\Sigma_0^n (\overline{n+1-x}\,.\,x^2)$,	20	50	105	196	336	540	825	1,210	$v = A + Bx + Cx^2$.
$\Sigma_0^n (\overline{n+1-x}\,.\,x^3)$,	46	146	371	812	1,596	2,892	4,917	7,942	
$\Sigma_0^n (\overline{n+1-x}\,.\,x^4)$,	116	470	1,449	3,724	8,400	17,172	32,505	57,838	

Co-efficients of v_x in values of L, M, N.

Argument, (x).	$n=3$			$n=4$			$n=5$			$n=6$			$n=7$			$n=8$			$n=9$			$n=10$		
	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N	L	M	N
	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$	$(n+1-x)$	$(n+1-x)x$	$(n+1-x)x^2$
0	4	..	..	5	..	..	6	..	..	7	..	..	8	..	..	9	..	..	10	..	..	11	..	..
1	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10
2	2	4	8	3	6	12	4	8	16	5	10	20	6	12	24	7	14	28	8	16	32	9	18	36
3	1	3	9	2	6	18	3	9	27	4	12	36	5	15	45	6	18	54	7	21	63	8	24	72
4	..	..	..	1	4	16	2	8	32	3	12	48	4	16	64	5	20	80	6	24	96	7	28	112
5	..	..	..	..	..	..	1	5	25	2	10	50	3	15	75	4	20	100	5	25	125	6	30	150
6	..	..	..	..	..	..	..	..	..	1	6	36	2	12	72	3	18	108	4	24	144	5	30	180
7	..	..	..	..	..	..	..	..	..	..	..	..	1	7	49	2	14	98	3	21	147	4	28	196
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	8	64	2	16	128	3	24	192
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	9	81	2	18	162
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	10	100

Argument, (n).	Coefficients of L, M, N in values of A, B, C.												Weights of A, B, C.			Square Roots of Weights of A, B, C.		
	A				B				C									
	α	λ_1	μ_1	ν_1	β	λ_2	μ_2	ν_2	γ	λ_3	μ_3	ν_3	G_a	G_b	G_c	$\sqrt{G_a}$	$\sqrt{G_b}$	$\sqrt{G_c}$
3	70	17	−20	5	42	−12	38	−13	42	3	−13	5	4·12	1·11	8·4	2·03	1·05	2·90
4	140	26	−25	5	168	−30	65	−17	168	6	−17	5	5·38	2·58	33·6	2·32	1·61	5·80
5	252	37	−30	5	168	−20	33	−7	504	10	−21	5	6·81	5·09	100·8	2·61	2·26	10·04
6	84	10	−7	1	252	−21	28	−5	252	3	−5	1	8·40	9·00	252	2·90	3·00	15·9
7	132	13	−8	1	2,772	−168	188	−29	2,772	21	−29	5	10·15	14·74	554·4	3·19	3·84	23·6
8	990	82	−45	5	1,848	−84	81	−11	5,544	28	−33	5	12·07	22·81	1,108·8	3·48	4·78	33·3
9	1,430	101	−50	5	10,296	−360	305	−37	10,296	36	−37	5	14·16	33·76	2,059·2	3·76	5·81	45·4
10	2,002	122	−55	5	18,018	−495	374	−41	18,018	45	−41	5	16·41	48·18	3,603·6	4·05	6·94	60·0

DEPRESSION OF MAXIMUM VELOCITY LINE

Central Vertical.

The Series are arranged by order of increasing relative depth of max velocity line at each Site
Argument, $\zeta = z - H$

SOLANI SITES	Serial No	Number of Sets	DATA Depth H	SURFACE FALL Sub-Reaches Upper F_1	 Middle F_2	 Lower F_3	Mean Velocity U	AVERAGE WIND Direction	 Velocity	DEPTH of maximum velocity Actual Z	 Probable Error $\pm R_z$	 Relative ζ
LEFT AQUEDUCT	1	20	9 46	5 67	No Middle Sub-Reach	5 30	3 99	SWbW	2	36	31	038
	3	12	7 25	5 85		3 83	3 63	S	5	1 04	51	143
	2	22	8 96	5 71		4 86	4 11	SEbE	1	1 30	19	145
	4	4	5 92	5 88		2 52	3 32	S	15	1 15	44	194
RIGHT AQUEDUCT [L. Aq closed]	19	8	4 21	6 39	No Middle Sub Reach	1 21	5 85	SW	2	−6 17	·00	−1 47
	20	10	3 99	6 61		99	5 47	SW	3	37	15	·093
	18	4	4 66	6 40		1 66	6 40	NWbW	6	1 23	51	264
RIGHT AQUEDUCT [Left Aqueduct open]	12	20	7 59	5 81		4 09	3 65	SbE	2	1 48	26	195
	8	16	8 42	5 82		4 62	3 95	NEbN	2	1 78	49	211
	16	16	6 01	6 3[illegible]		2 8	3 89	S	4	1 33	35	221
	17	3	5 55	6 35		3 05	3 66	S	6	1 38	55	249
	15	9	6 21	6 15		2 62	4 02	N	5	1 60	·38	·257
	11	15	7 75	5 86		4 23	3 99	W	2	2 04	43	263
	13	4	7 15	6 06		3·85	3 99	Calm		1 89	37	264
	7	18	8 85	5 80		4 86	4 00	SbW	<	2 34	1 43	264
	9	14	8 32	5 96		4 53	4 31	SbW		2 22	77	267
	5	16	9 94	5 98		5 45	4·61	NEbE	2	3 23	75	325
	6	16	9 41	5 84		5 23	4 27	NEbE	4	3·08	70	327
	14	16	6 77	5 96		3 19	3 91	SbW	5	2 27	69	·335
EMBANKMENT, MAIN SITE.	28	16	6 16	4 70	91	1 12	2 63	N	5	− 13	·00	− ·021
	21	16	10 89	4 77	1 19	5 39	4 27	E	4	27	1 29	·025
	23	10	7 19	5 21	1 15	5 34	4·01	Calm.		49	98	·063
	24	6	7 39	4 63	1 41	2 81	3 26	W	8	1·06	48	143
	27	16	6 14	5 01	1 12	2 41	3 21	N	2	1 09	19	175
	25	12	7 16	5 22	1 23	3 02	3 74	NNE	4	1 29	29	178
	26	7	6·50	4 86	91	1 58	3 85	S		1 58	58	·243
	22	16	7 93	4 64	1 38	3·05	3 41	SSE	4	2·28	51	288

PARAMETER-VARIATION.

Central Vertical Velocity-Parabolæ.

The Series are arranged by order of decreasing parameter at each Site (Argument, p)

Serial No.	Number of Sets	PARAMETER. Magnitude p	PARAMETER. Probable Error. $\pm R_p$	DATA. Depth H	DATA. Depth of Max Vely z	DATA. Mean Vely U	DATA. Surface-Fall Upper Sub-Reach F_s	$(v_M - U)$	TRIAL QUANTITIES for tracing parameter variation. $H^2 - 12(v_M - U)$.	$H^2 - U$	$H^2 - \sqrt{U}$	$H^2 - \sqrt{\beta U}$.	$(H-Z)$.	$(H-Z)^2$	$(H-Z)^2 - \sqrt{U}$.	$(H-Z)^2 - U$	$(H-Z)^2 - \sqrt{HF}$
Solání Left Aqueduct.																	
1	20	102 4	8 2	9 46													
2	22	69 7	3 6	8 96													
3	12	42 2	7 6	7 25													
4	4	27 7	4 9	5 92	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Solani Right Aqueduct [Left Aqueduct closed]																	
19	8	155 5	0	4 21	−6 17	5 85	6 39	00	∞	3 0	7 8	8 7	10 88	107 7	44 5	18 42	20 77
18	4	30 1	7 1	4 66	1 23	6 40	6 40	+ 03	60	3 4	8 6	10·4	3 43	11 8	4 7	1 88	2 18
20	10	18 7	2 0	3 99	37	5 47	6 61	+ 03	44	2 9	6·8	8·0	3 62	13 1	8 6	2 39	2 54
Solání Right Aqueduct.																	
6	16	89 5	12 6	9 41													
5	16	89 3	13 2	9 94													
8	16	79 5	9 9	8 42													
7	18	79 2	47 8	8 85													
9	14	75 0	13 9	8 32													
11	15	62 0	7 2	7 75													
13	4	49 1	5 0	7 15													
12	20	48 0	3 6	7 59													
15	9	42 2	5 2	6·22													
14	16	36 4	6 4	6 77													
16	16	33 7	4 6	6 01													
17	3	27 4	5 7	5 55	2 38	3 66	6 35	+ 10	26	8 4	16 1	20·1	4 17	17 4	9 1	4 75	2 92
Solani Embankment, Main Site																	
21	16	206 5	61 8	10·89													
23	10	73 1	26 6	7 79													
28	16	62 7	0	6 16													
24	6	61 2	9 0	7·39													
25	12	54 6	5 4	7 36													
22	16	50·9	6 8	7·93													
27	16	45·9	3 5	6 24													
26	7	30 5	6 5	6 50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

MEAN VELOCITY PAST CENTRAL VERTICAL, VARIATION.

The Series are arranged by order of decreasing Mean Velocity past the vertical (Argument, U)

Serial No.	Number of Sets	Mean Velocity	DATA						TRIAL QUANTITIES for approximation to the Mean Velocity.									Ratio U — v_0
			Surface Velocity	Depth	Surface-Fall				Type HF.			Type $\sqrt{HF}$		Other Types				
					Upper Sub-Reach	Middle Sub-Reach	Lower Sub-Reach	Whole Reach										
		U	v_0	H	F_1	F_2	F_3	F	HF_1	HF_3	HF	$\sqrt{HF_1}$	$\sqrt{HF}$	$F_3\sqrt{H}$	$F_1^2\sqrt{H}$	$F_1\sqrt[4]{H}$	$\sqrt{F_1\sqrt{H}}$	ρ
SOLANI LEFT AQUEDUCT																		
2	22	4 11	4 34	8 96	5 75	No Middle Sub-Reach	4 86	10 57	51 2	No Middle Sub-Reach	94 7	7 15	9 73	17 1	97 6	9 88	4 13	947
1	20	3 9[illegible]	4 25	9 46	5 6[illegible]		5 30	10 9[illegible]	53 6		103 8	7 32	10 19	17 5	98 4	9 92	4 18	939
3	12	3 63	3 82	7 25	5 85		3 83	9 68	42 4		70 2	6 51	8 36	15 7	92 0	9 59	3 97	950
4	4	3 3[illegible]	3 47	5 92	3 88		2 52	8 40	34 8		49 7	5 90	7 0[illegible]	14 3	84 1	9 17	3 78	957
SOLÁNI RIGHT AQUEDUCT [Left Aqueduct closed]																		
SOLANI RIGHT AQUEDUCT																		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No Middle Sub Reach	[illegible]	[illegible]	[illegible]		113 6	7 71	10 66	18 8	111 9	10 58	4 34	1 007
SOLANI EMBANKMENT, MAIN SITE																		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	973
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	955
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	964
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	997
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	962
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	961
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	979
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	926

ROD-MOTION, COMPARISON i.

Solâni Twin Aqueducts—Central Vertical.

Rod-Velocity of Rods of 1', 2', 3', &c., x feet immersion compared with Mean Velocity.
Measurement through 1', 2', 3', &c. x feet depth deduced from Double-Floats.

	1					2	3		4		6									
	Serial No.						Surface-Fall.		Average Wind.		Rod-Velocities (u_x) and Double-Float Mean Velocities (U_x') past the central vertical through depths named below									
											Nominal Depths (x)									
SITE.	Present	1874-5 Report	Instrument	Description of each line	Number of Sets	Depth on vertical H	Upper 5 miles F_1	Lower 4½ miles F_2	Direction	Velocity	x	0	1	2	3	4	5	6	7	
SOLANI LEFT AQUEDUCT	·	11R	Rods	Mean,	1	7·2	5·83	3·83	S	2	u_x=	3·82	3·88	3·86	3·80	3·78	3·66	3·55	?	3
				Range,		·00	·00	00	..		..	34	54	25	24	34	31	39	..	
	3	11B	Double-Floats	Mean,	1	7·2	5·83	3·83	S	[illegible]	U_x'=	3·82	3·85	3·87	3·86	3·81	3·76	3·70	?	3
				Range,		00	00	00	..		..	34	..	·		..	..			2
			Differences ($u_x - U_x'$),					..	·		..	·00	+·03	−·01	−·06	−03	−10	−15		−·0
	·	10R	Rods	Mean,	4	5·97	5·83	2·52	S	15	u_x=	3·47	3·58	3·43	3·42	3·34	3·31	..	·	3·31
				Range,		·03	·05	05	·		..	07	04	13	16	14	·33	·	·	33
	4	10B	Double-Floats	Mean,	4	5·97	5·08	2·57	S	15	U_x'=	3·47	3·51	3·53	3·51	3·45	3·39	..	..	3·32
				Range,	·	05	05	05	..		..	..	..	..	·		..	..	..	10
			Differences ($u_x - U_x'$),					..	·		..	·00	+·07	−·10	−·09	−·11	−·08	..	·	−·01
SOLANI RIGHT AQUEDUCT	..	12R	Rods	Mean,	20	7·59	5·81	4·07	S E	2	u_x=	3·80	3·83	3·84	3·85	3·79	3·74	3·64	3·57	3·57
				Range,	·	·10	10	10	..	·	..	44	·35	45	30	43	41	47	·57	57
	12	12B	Double-Floats	Mean,	20	7·59	5·81	4·09	S E	2	U_x'=	3·80	3·83	3·85	3·84	3·82	3·78	3·75	3·68	3·65
				Range,	·	·10	·10	·10	..	·	..	·30	..	..	..	·	..	..	..	22
			Differences ($u_x - U_x'$),					..	..		..	·00	·00	−·01	+·01	−·03	−·04	−11	−11	−·03

ABSTRACT TABLE 10.

EFFECT OF DEPTH ON VELOCITY.

SOLÁNÍ EMBANKMENT, MAIN SITE—ABSTRACT OF MEAN VELOCITIES OVER TOP IMMERSED STEP OF EITHER BANK.

(The number of Sets of velocity measurements over the top immersed step is not always the same on both banks: the velocity measurements on one bank having been occasionally omitted where the depth of water on the step was trifling).

Series	Range of water-level	LEFT BANK.					RIGHT BANK.				
		Number of Sets	Step No.	Depth on Step	Mean Velocities.		Number of Sets	Step No.	Depth on Step	Mean Velocities.	
					From — To	Remarks.				From — To.	Remarks.
151	16	1	4	·09	46	.. ..	5	4	28—12	1 38—·90	Irregular decrease
		4	5	75—·68	1 84—1 67	Irregular					
152	20	1	4	08	58	.. ..	15	4	27—06	1 36—64	Fairly regular decrease
		10	5	78—57	2 06—1 52	Irregular decrease	2	5	76	1·68—1 65	
153	28	6	5	51—·23	1 64—·85	Steady decrease	6	5	70—42	2·06—1 47	Nearly steady decrease
154	18	5	6	72—54	1 67—1 34	Nearly steady decrease ..	3	5	·18—07	2 05—81	Irregular decrease
							2	6	73—72	1·90—1 88	
155	29	6	6	35—06	1 44—47	Nearly steady decrease ..	6	6	53—24	2 08—·96	Nearly steady decrease
156	06	4	7	76—70	1 55—1 45	Irregular	4	6	18—12	97—·71	Steady decrease.
157	19	7	7	53—34	1 41—96	Irregular decrease . ..	7	7	69—50	1 74—1 20	Irregular decrease.
158	10	1	7	14	86	.. ..	2	7	·40—30	1 36—1 19	Steady decrease
159	22	9	8	71—40	1·59—1 19	Irregular	3	7	13—·05	1 62—58	Steady decrease.
							3	8	·76—63	1 66—1 35	Steady decrease.
160	27	1	8	23	68	.. ..	5	8	·37—10	1 48—60	Nearly steady decrease.
		2	9	77—73	1 32—1 21	Increase					
161	15	11	9	65—50	1 21—82	Irregular decrease	11	9	78—63	1 51—1·27	Irregular decrease.
162	26	3	9	32—17	1 29—60	Irregular	5	9	45—19	1 19—·79	Nearly steady decrease
163	15	2	10	19—15	73—63	Decrease	5	10	·31—16	85—·76	Irregular decrease.
164	00	1	11	51	60	.. ..	1	11	65	1 49	
165	·15	6	11	28—13	1 01—75	Nearly steady decrease ..	6	11	42—27	98—·83	Irregular decrease.
166	27	3	12	·53—26	1 14—85	Irregular decrease	8	12	68—41	1·03—90	Steady decrease.

ABSTRACT TABLE 11

TRANSVERSE VELOCITY CURVES

AREA AND DISCHARGE FORMULÆ AND FLOAT COURSE SPACINGS

r Edge t, top [illegible] read [illegible] quadrilect[illegible] of Side Space [illegible] middle of Side Space No [illegible] measurements at points marked with * or † viz e* q† 75* s* 42½* 71¼† 40½†
Values [illegible] at the edge (i.e. at e* 75* 84 42½*) assumed zero in computing Discharge. Velocities interpolated [illegible] measured at q† 7 ¼† 40½†

	SITE	NUMBER OF		AREA AND DISCHARGE FORMULÆ and FLOAT COURSE SPACINGS											BREADTH		
		Sets of velocity work	Observed Ordinates	Left of Centre					+	Right of Centre					Bed	Surface	
				+	Side Space	+	Inter Space	+	Centre Space	+	Inter Space	+	Side Space	+		From	To
15th Mile Site.	Old Site	18	19	+ •	Cubic 84 82½	+ 80	Simson's 75 70 65	+ 60	Weddle's 40 20 0 20 40	+ 60	Simson's 65 70 75	+ 80	Cubic 82½ 84	+ e*	?160	175	171
	New Site	4	19	+ e*	Simson's modified q m q†	+ 80	Simson's 75 70 65	+ 60	Weddle's 40 20 0 20 40	+ 60	Simson's 65 70 75	+ 80	Simson's modified q† m q	+ e*	160	186	184
Solani Embankment Main Site.	Low Water (below steps)	54	15	+ 75*	Simson's modified 73¾ 72½ 71¼†	+ 70	Simson's 65	+ 60	Weddle's 40 20 0 20 40	+ 60	Simson's 65	+ 70	Simson's modified 71¼† 72½ 73¾	+ 75*	150′	150	150
	High Water (above lowest step)	99	16 to 21	+ t	Special q m	+ 75½ ; 74½	Cubic 70 65	+ 60	Weddle's 40 20 0 20 40	+ 60	Cubic 65 70	+ 74½ ; 75½	Special m q	+ t	150	171	151
	Minor Sites	10	17	+ 84*	Simson's 82	+ 80	Simson's 75 70 65	+ 60	Weddle's 40 20 0 20 40	+ 60	Simson's 65 70 75	+ 80	Simson's 82	+ 84*	150	169	168

SOLANI	Left Aqueduct	45	17	+ Parabolic + Simson's + Weddle's + Simson's + Simson's modified + 42½* 39½ 37½ 35 32½ 30 20 10 0 10 20 30 32½ 35 37½ 40 40½† 41¼ 41¾ 42½*	83¼	85	82
	Right Aqueduct	186	17	+ Simson's modified + Simson's + Weddle's + Simson's + Parabolic + 42½* 41¾ 41¼ 40½† 40 37½ 35 32½ 30 20 10 0 10 20 30 32½ 35 37½ 39½ 42½*	83¼	85	82
	Belra	53	15	+ Simson's + Cubic + Weddle's + Cubic + Simson's + e* m 90 80 70 60 40 20 0 20 40 60 70 80 90 m e*	180	189	187
	Jaol	55	19	+ Simson's + Simson's + Cubic + Weddle's + Cubic + Simson's + Simson's + e* m 92½ 87½ 82½ 75 67½ 60 40 20 0 20 40 60 67½ 75 82½ 87½ 92½ m e*	[illegible]18·5	193	191
	Kamhera	56	17	+ Simson's + Cubic + Simson's + Cubic + Simson's + e* m 27½ 25 22½ 20 15 10 5 0 5 10 15 20 22½ 25 27½ m e*	[illegible]85	66	64
DISTRIBUTARIES	Right Jaoli	4	11	+ Triangle or Wedge + Simson's + Triangle or Wedge + e* 10 8 6 4 2 0 2 4 6 8 10 e*	[illegible]16	25	22
	Mansurpur	5	13	+ Triangle or Wedge + Weddle's + Triangle or Wedge + e* 6 5 4 3 2 1 0 1 2 3 4 5 6 e*	[illegible]8	14	14
	Miránpur	3	13	+ Triangle or Wedge + Weddle's + Triangle or Wedge + e* 6 5 4 3 2 1 0 1 2 3 4 5 6 e*	[illegible]12	14	14
	Pimora	4	11	+ Triangle or Wedge + Simson's + Triangle or Wedge + e* 5 4 3 2 1 0 1 2 3 4 5 e*	[illegible]8	13	13

MEAN VELOCITY CURVES AT SAME WATER LEVEL ABSTRACT TABLE 12.

PROPORTIONALITY OF CORRESPONDING VELOCITY ORDINATES

SOLANI SITES	Serial No.	No of Sets	Gauge	Hyd Mean Depth	ROD VELOCITIES past each vert cal * The Reduced Velocities are the Rod velocities of the upper Series reduced in the ratio of the Mean Velocities of the two Series compared																			MEAN VELOCITY	Ratio of
						Left of Centre									Centre	Right of Centre									
			A or H	R	Distances	42½	41½	40	37½	35	32½	30	20	10		10	20	30	32½	35	37½	39½	41½	V	V,V
RIGHT AQUEDUCT [L. Aq open]	124	1	3 49	3 26	Rod velocy	?	2 20	2 31	2 44	2 61	2 53	2 46	2 47	2 53	2 60	2 65	2 52	2 44	2 21	2 25	2 17	2·03	?	2 43	3 42
					Reduced do	?	64	63	71	76	74	72	72	74	76	73	74	71	65	66	63	59	?	71	
	123	1	3 65	3 40	Rod velocy	?	61	62	70	65	69	68	67	73	72	78	78	76	75	72	73	63	?	71	
					Difference		+ 03	+ 06	+ 01	+ 11	+ 05	+ 04	+ 05	+ 01	+ 04	00	− 04	− 05	− 10	− 06	− 10	− 04		00	
[L. Aq closed]	134	1	3 58	3 33	Rod velocy	?	2·08	2 27	2 27	2 70	2 83	2 93	3 19	3 49	3 70	3 59	3 51	3 51	3 39	3 11	2 79	2 78	?	3 22	4 67
					Reduced do.	?	45	49	49	58	61	63	68	75	70	77	75	75	73	67	60	60	?	69	
	133	1	3 60	3 3	Rod velocy	?	6	65	71	65	63	65	65	64	71	79	77	73	77	74	73	65	?	69	
					Difference		− 16	− 16	− 22	−·07	− 02	− 02	+ 03	+ 11	+ 08	− 02	− 02	+ 02	− 04	− 07	− 13	− 05		00	
							75	73½	72½	70	65	60	40	20	0	20	40	60	65	70	72½	73½	75		
EMBANKMENT MAIN SITE.	170	2	3·64	4 73	Rod velocity		?	97	1 13	1 19	1 28	1 28	1 74	1 68	1 43	1 46	1 64	1 52	1 24	1 08	1 00	93	?	1 50	1 74
					Reduced do		?	57	65	68	74	74	1 00	97	82	84	94	87	71	62	57	53	?	86	
	171	3	3 62	4 72	Rod velocity		?	56	60	64	74	71	1 00	·97	84	89	93	83	68	63	59	52	?	·86	
					Difference			+ 01	+ 05	+ 04	00	+ 03	00	00	− 02	− 05	+ 01	+ 04	+ 03	− 01	− 02	+ 01		00	
	170	2	3 64	4 73	Rod velocity		?	99	1 13	1 19	1 28	1 28	1 74	1 68	1 43	1 46	1 64	1 52	1 24	1 08	1 00	93	?	1 50	2 27
					Reduced do.		?	44	50	52	56	56	77	74	63	64	72	67	·55	48	44	41	?	66	
	172	2	3·58	4 68	Rod velocity		?	39	45	50	52	52	79	71	67	69	75	63	48	43	40	38	?	66	
					Difference .			+ 05	+ 05	+ 02	+ 04	+ 04	− 02	+ 03	− 04	− 05	− 03	+ 04	− 07	+ 05	+ 04	+ 03		00	
	177	4	2 42	3 64	Rod velocity		?	90	1·07	1 21	1 26	1 30	1 77	1 62	1 40	1 45	1 67	1 48	1 19	1 06	97	89	?	1 50	1 85
					Reduced do. .		?	49	53	65	63	70	·86	82	76	78	90	80	64	57	52	48	?	81	
	178	2	2 43	3 64	Rod velocity		?	55	58	65	71	71	90	84	75	·83	93	80	·65	62	57	54	?	81	
					Difference .			− 06	00	00	− 03	− 01	+ 06	+ 04	+ 01	− 05	− 03	00	− 01	− 05	− 05	− 06		00	

ABSTRACT TABLE 13.

SURFACE, MID DEPTH, AND BED VELOCITY CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXIX to XXXIII with additions.

The upper line of each Series shows the Mean Results the second line shows the Ranges of the Results.

SOLANI SITES.	1			2					3			4		6	7	8		TRANSVERSAL.
							FLOATS		SURFACE-FALL			AVERAGE WIND						
	Detailed Table	Serial No.	Number of Sets	Gauge Reading	Hyd Mean Depth.	Surface-Breadth	Sub Float Weight W Upper D	Length of Connector	Upper 5 Miles.	Lower 4½ Miles	Surface Slope (Right or Left Bank)	Direction	Velocity	Central Velocity	Scpl Discharge in sq ft per sec.	Mean Velocity	Ratio U—v_0	
				h or H	R	b			F_1	F_2	S			v_0	D	U	c	
L. AQUEDUCT	XXIX.	51	15	8 97 15	7 42 09	83 7 2			5 76 05	4 93 ·15	?	SSW	3	4 24 24	320 1 22	3 8 26	013 •	
		52	14	8 83 15	7 33 10	83 8 2			5 73 05	4 84 20	?	SSW	3	4 2 45	326 7 22 0	3 84 27	008 ••	
RIGHT AQUEDUCT	XXX	53	16	9 00 13	7 92 05	82 0 5	Surface-Floats—3" × ¼" plus Discs	No Connector used	6 01 18	5 44 23	180 L 030	NE	2	4 70 76	367 45 5	4 33 54	010 •	SURFACE
		54	4	9 10 20	7 50 12	83 4 3			5 68 10	5·09 10	?	NW b W	5	4 19 36	328 7 5 0	3 8 06	024	
		55	1	8 78	7 30	83 9			5 92	4 88	?	SSW	1	4·05	320 9	3 78	033	
		56	16	8 71 15	7 25 10	83 9 1			5 73 15	4 71 15	?	SSW	2	4 19 79	321 33 4	3 79 40	00[illegible]	
	XXXI.	57	16	8 [illegible] 12	7 15 03	84 1 1			6 12 55	4 66 55	?220 L ?055	W b N	2	4 49 89	3[illegible] 41 5	4 1[illegible] 49	024 ••	
		58	14	8·07 27	6 81 20	84 4 1			6·17 1 43	4 27 78	?193 R ?115	S b W	1	4 38 96	346 0 53	4 06 63	027 ••	
		59	3	7 57 20	6 46 15	84 5 0			?6 03 ? 20	4 07 20	?	S b W	7	4 17 63	333· 18 1	3·93 21	042 ••	
EMBANKMENT [Minor Sites]	XXXIII.	60	10	9 59 ·16	?	168 4 1 2			5 73 05	4 92 10	?	ESE	[illegible]	4 24 65	685 46 5	4 08 21	002 ••	
R. AQUED.	XXXII.	61	16	10·00 24	7 98 15	82 0 0	C	5	5·93 37	5 57 19	?	NE	2	4 6[illegible] 69	36[illegible] 3[illegible]	4 29 44	030	MID-DEPTH
		62	1	9 0[illegible]	7 47	83 [illegible]	O	4½	5 80	4 70	?	SW b S	11	4 32	350	4 [illegible]	0[illegible]	
R. AQUEDUCT	XXXII.	65	3	10·00 00	7 9[illegible] 00	82 0 0	C	10	6 09 00	5 52 05	?	NE b E	4	4 50 0	357·0 5 4	4 2 ·06	030	BED
		66	4	8 77 30	7 2 20	83·9 3	W	8	5·81 17	4 85 25	?	SW b W	1	3·61 1	294 7	3 4 ·04	0[illegible] ••	

ABSTRACT TABLE 14.

MEAN VELOCITY CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXXIV., XXXV., XLI LVI with additions.
The upper line of each Series shows the Mean Results the second line shows the "Ranges" of the Results.

SITES.	1			2					3			4		6	7	8	
							ROD		SURFACE-FALL.			AVERAGE WIND					
	Detailed Table	Serial No	Number of Sets	Gauge-Reading	Hyd Mean Depth	Surface-Breadth.	Wood (W) Tin (T)	Length	Upper 5 miles	Lower 4½ miles	Surface-Slope (lighter Left Bank)	Direction	Velocity	MEAN VELOCITY past centre vertical	CUBIC DISCHARGE	MEAN VELOCITY	Ratio V — U_c
				A or H	R	b		l	F_1	F_2	S			U_c	D	V	c
SOLANI LEFT AQUEDUCT	XXXIV.	101	3	9 90 17	7 94 08	82 2 5	T	9·0 0	5 92 08	5·49 ·14	189 L 012	SE b E	1	4 31 24	3 42 32	4 06 09	942 ••
		102	10	9 63 25	7 79 16	82 5 0	W	9 0 0	5·64 25	5·45 25	?	Calm		3 74 63	2 922 209	3 57 26	955 •
		103	4	9 42 11	7 65 07	82 5 0	T	8 9 5	5 91 16	5·05 51	207 L 017	SW b W	3	3 96 42	3,005 97	3 87 09	977 ••
	XXXV.	104	12	9 05 25	7 47 15	83 5 3	W	8 5 0	5 70 30	5 12 15	?	N	1	3 80 47	2,771 202	3 61 16	950 ••
		105	2	8 61 13	7 19 09	84 0 1	T	8·0 0	5 89 07	4 64 20	222 L 007	W b N	2	3 81 29	2,705 152	3 70 16	971 ••
		106	6	8 02 22	6 78 15	85 0 0	T	7 5 0	5·88 17	4 27 22	?206 L ?032	S b E	4	3 61 2°	2 381 235	3 47 20	961 ••
		107	6	7 50 13	6 41 10	85·0 0	T	7 0 0	5 92 15	3 94 08	?225 L ?015	WSW	1	3 54 20	2,18 00	3 43 13	969 ••
SOLANI RIGHT AQUEDUCT [Left Aqueduct closed]	XLI	131	2	4·60 00	4 20 ·00	85·0 0	T	4 0 0	3 60 00	10 00	025 R 002	SW	2	1 3[illegible] 06	481 19 5	1 24 05	932 ••
		132	2	3 96 05	3 65 04	85 0 0	T	3 0 0	6 17 00	96 05	473 R 015	Calm		5 15 ·04	1 623 51	4 83 09	938 ••
		133	1	3 60	3 35	85 0	T	3 0	4 35	00	?	NE	5	71	212 0	69	972
		134	1	3 58	3 33	85 0	T	3 0	6·22	88	?	SW b S	10	3 ,0	979 3	3 32	870
		135	1	3 18	2 99	85 0	T	2 5	6 22	·68	253 R	Calm		3 5	805 6	3 20	896
		136	1	3 12	2 94	85 0	T	2 5	6 28	·62	208 R	Calm		3 19	740	2 79	875
		137	1	3 13	2 94	85·0	T	3 0	6 47	43	200 R	SW	0	2 78	667 8	2 51	937
		138	1	2 88	2 72	85 0	T	2·0	6 52	18	145 R	Calm		2 76	690	2 54	920
		139	2	2 66 11	2 52 10	85 0 0	T	2·0 0	5·95 11	16 11	151 R 035	S	1	2 4 10	496·5 58 6	2 20 17	891 ••
DISTRIBUTARIES. Right Jaoli	LVI	231	2	4 35 01	2 79 00	25·0 ·0	T	•	No Observations.			Calm		2 67 12	190· 4	2 52 01	·944 •
		232	2	3 10 01	1 99 01	22·0 0	T					Calm		2 32 10	97 7 0	2 10 00	905
Mansurpur		233	4	3 97 23	2 32 07	14 2 3	T		No Observations			N	1	2 36 22	86 4 9 9	2 10 11	890
		234	1	3·60	2 10	13·8	T	•				Calm		2 29	72 6	2 05	895
Mirânpur		235	1	3 75	1 63	14·0	T	••	No Observations.			Calm		1 6	41 4	1 59	952
		236	2	2 83 00	1 16 00	13 5 0	T	•				WNW	5	1 59 02	25 5 4	1 49 00	937 ••
Pimora		237		3 79 ·01	2 16 00	13·0 0	T	••	No Observations			NW	5	2 11 05	63·1 5	1 83 02	867
		238	2	3 33 09	1·94 03	12 5 0	T	•				W	1	1 95 11	50·0 4 3	1 75 03	884 ••

ABSTRACT TABLE 15.

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XXXVI to XL with additions

The upper line of each Series shows the Mean Results the second line shows the Ranges of the Results.

SITE	1			2					3			4		6	7	8	
	Detailed Table.	Serial No	Number of Sets	Gauge Reading	Hyd Mean Depth	Surface Breadth.	Rod Wood (W) Tin (T)	Rod Length.	Surface Fall Upper 4 miles	Surface Fall Lower 4½ miles	Surface-Slope (Right Bank)	Average Wind. Direction.	Average Wind. Velocity	Mean Velocity past centre vertical	Cubic Discharge	Mean Velocity	Ratio V — U₀
				H	R	b		l	F_1	F_2	S			U_0	D	V	c
SOLANI RIGHT AQUEDUCT.	XXXVI.	108	19	9 96 19	7 96 11	82·0 5	T	9 3 5	5 85 24	5 61 28	?218 ?030	NE b E	1	4 21 51	3,384 387	4 00 45	950 ..
		109	18	9 61 18	7 78 ·12	82 5 0	T	9·0 ·0	5 91 43	5 24 64	?193 ?018	NE b E	3	4·1 89	3,231 513	3 95 61	·950 ..
	XXXVII.	110	20	9 33 ·17	7 61 07	82 8 6	W * T	9·0 5	5 86 46	5 22 39	?193 ?022	N	1	3 98 71	3,03 547	3 8 63	962 ..
		111	16	8·97 16	7 42 10	83 7 2	T	8 5	5 91 ·59	?4 87 ? 54	?19 ?023	N b W	1	4 0 04	2,941 284	3 86 37	938 ..
	XXXVIII.	112	18	8 58 26	7 10 ·17	84 1 2	T	8 0 0	5 85 19	4 71 39	?208 ?027	NW b W	1	3 92 6	2,716 250	3 7 29	932 ..
		113	1	8 10	6 88	84 3	T	7 5	5 84	4 36	228	W	?	4 29	2,60	3 8	807
		114	20	7 98 16	6 75 11	84 4 0	T	7 1 5	5 85 23	4 28 16	?204 ?015	SSW	3	3 7 50	2,43 19	3 6 29	957 ..
	XXXIX.	115	1	7 80	6 63	84 4	T	7·0	6 10	4 10	19	Calm		3 9	2,561	3 86	977
		116	7	7 40 16	6 41 12	84 5 0	T	7·0 0	5 95 21	3 79 1 11	?20 ?011	NW b W	1	3 79 43	2,27 223	3 59 17	947 ..
		117	2	7 09 02	6 14 ·02	85·0 0	T	6·3 5	6 06 12	3 19 1 18	220 021	NE b N	2	3 81 0	2,20 73	3 6 18	963
		118	16	6 67 23	5 83 17	85·0 0	T	6 0 0	5 99 12	3 21 49	?22 ?015	S	4	3 7 40	2,03 155	3 59 17	[illegible] ..
		119	7	6 15 ·30	5 43 23	85 0 0	T	5 4 5	6 53 67	2 61 1 12	245 133	NNE	1	3 89 26	1,954 24	3 74 43	961 ..
	XL.	120	9	5 78 30	5 14 24	85 0 0	T	5·3 5	5 89 20	2 20 91	?	SSW	3	3 35 4	1,581 143	3 2 34	964 ..
		121	2	5 61 05	5·00 04	85 0 0	T	5·0 0	6 25 ·15	2 31 1 55	240 120	S	2	3 57 30	1,65 12	3 43 06	961 ..
		122	13	4 48 24	4 10 20	85 0 0	T	4·0 5	5 82 1 26	?1 81 ? 53	?23 ?135	S b E	3	3 05 75	1,10 21	2 90 66	951 ..
		123	1	3 6	3 40	85 0	T	3·0	4·30	·0	?	Calm		72	218	7	986
		124	1	3 40	3 26	85 0	T	3 0	6 61	1 29	19	N	5	2·6	722 2	2 43	·935
		125	1	2 02	1 95	85 0	T	1	7 78	42	20	S	1	1 6	276	1 6	976
		126	1	1 92	1 65	85·0	T	1	5 93	?—38	?	S	0	1 20	202	1 24	1·033
		127	1	70	69	84 3	W		7 40	?·00	11	S	10	5	35	6	1·053

* 12 Sets with wood Rods 8 Sets with tin Rods.

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables XLII. to XLVI., with additions.

The upper line of each Series shows the "Mean Results", the second line shows the "Ranges" of the Results.

SITE	1 Detailed Table.	1 Serial No.	1 Number of Sets	2 Gauge Reading A	2 Hyd. Mean Depth. R	2 Surface-Breadth. b	Rod Tin (t)	3 Surface-Fall. Upper 4 miles F_1	3 Surface-Fall. 1 mile below Site F_2	3 Surface-Fall. Lower 4½ miles F_3	3 Surface-Fall. Surface Slope (Lalli ...) S	4 Average Wind. Direction	4 Average Wind. Velocity	6 Mean Velocity past centre vertical U_0	7 Cubic Discharge D	8 Mean Velocity. V	8 Ratio $V \div U_0$ c
SOLANI EMBANKMENT, MAIN SITE	XLII.	151	5	9·94 16	9·31 ·07	170·1 1 2	T	4·70 ·09	1 2[illegible] ·10	3·46 20	227 00[illegible]	EbE	4	4·[illegible] 6	7,17[illegible] 484	4·02 20	·033 ··
		152	1	9 91 26	9·17 15	170 3 2·3	T	4 73 13	1 13 20	3·94 ·10	[illegible] 2024	S b E	[illegible]	4·6 ·6	6,72[illegible] 545	3 83 26	·0[illegible] ··
		153	6	9·[illegible] 2[illegible]	8·9[illegible] 21	16[illegible] 0	T	4·72 21	1·21 ·19	3·16 72	[illegible] 05	SW b W	2	3·6[illegible] 2	6,27[illegible] 435	3·71 20	[illegible] ··
	XLIII.	154	[illegible]	9·0 ·15	8·6[illegible] 15	167·0 1 2	T	4·71 14	1·32 13	4 [illegible] 12	[illegible] [illegible]03	SW b W	4	3·8 ·3	5,974 425	3 70 15	·061 ··
		155	6	8·74 ·09	8·4[illegible] 24	166·2 ·0	T	4 72 ·40	1 20 14	4·6[illegible] 30	217 049	W		3·84 7	5,504 1,141	3·59 63	·032 ··
		156	4	8·43 ·06	8 23 ·04	16[illegible]·2 0	T	3·90 05	2·07 03	3·93 03	[illegible] ?	NE	[illegible]	3 3 ·3	4,84 26	3·24 17	·061 ··
		157	7	8·12 19	8·01 ·16	164·0 ·0	T	4·63 ·07	1 [illegible] 11	4 [illegible] 33	219 [illegible]	W	1	3 [illegible] ·64	4 53[illegible] 4[illegible]	3 32 26	·049 ·
		158	[illegible]	7·9[illegible] 10	7·54 ·05	164·0 ·0	T	4 51 ·15	1 2[illegible] 15	4 23 25	21[illegible] 000	W	[illegible]	3 [illegible] 0[illegible]	4,[illegible] 65	3 43 01	·003 ·
	XLIV.	159	[illegible]	7·33 22	7 64 ·13	162·4 1 2	T	4·50 1·07	1·2[illegible] 19	3·3[illegible] 15	·214 ·011	WSW	[illegible]	3 42 ·3[illegible]	4,4[illegible] 59[illegible]	3 ·6 35	·033 ··
		160	[illegible]	7·0[illegible] 27	7·2[illegible] 15	161·3 1 2	T	4·67 ·15	1 32 ·07	3·[illegible] ·22	214 010	W b S	4	3 [illegible] ·3	4,19[illegible] 91	3 22 10	·076 ··
		161	11	6 82 ·15	7 12 ·12	159·3 ·0	T	4·65 ·03	1·27 ·05	3·39 ·33	·217 ·006	S b [illegible]	4	3 3[illegible] ·3	3,86[illegible] 15	3 44 11	·018 ··
	XLV.	162	[illegible]	6·5[illegible] 26	6·7[illegible] 22	159·3 ·0	T	5·10 ·33	1 11 ·17	3·1[illegible] ·30	221 193	SE b E		3·46 4	3,97 31	3 39 37	·0[illegible]0 ··
		163	[illegible]	[illegible] 15	6·18 12	157·0 0	T	5·11 ·10	1·23 01	2·62 14	171 05[illegible]	WSW	[illegible]	3 34 4	3,194 23	3·05 ·20	·013 ··
		164	1	5·24	5·9[illegible]	154 7	T	5·29	1 72	2·49	?	NW b W	4	2 8	2,71	2 73	·0[illegible]1
		165	[illegible]	4 [illegible] 15	[illegible]·74 ·13	154 7 ·0	T	4·63 ·49	·91 53	1 17 1 12	216[illegible] [illegible]010	S b E	[illegible]	2·[illegible] 21	2,13[illegible] 52[illegible]	2 56 ·49	·070 ··
		166	[illegible]	4·41 ·2[illegible]	3·5[illegible] 23	1[illegible]2·3 ·0	T	1 15 17	1 10 ·35	1 7[illegible] 65	? ?	E[illegible]		2 [illegible] 11	2,0[illegible]1 14	2 33 ·07	·023 ··
	XLVI.	167	10	4·01 17	5·01 11	15[illegible] 1 2	T	4·65 ·39	·91 ·35	1 74 1·00	210[illegible] 02	S b W	[illegible]	2 18 ·4	1,[illegible] 94	2 14 14	·0[illegible]2 ··
		168	1	3·9	5·00	151 2	T	4 4[illegible]	·6[illegible]	·60	?	E b N	1·[illegible]	1 72	1,2[illegible]	1·69	·0[illegible]3
		169	10	3·74 0 [illegible]	4·[illegible] ·05	150·0 ·0	T	4·64 ·39	1 12 63	·67 1 33	2[illegible] [illegible]	E	[illegible]	1·84 5	1,414 261	1·85 ·33	1·027 ··
		170	[illegible]	3·64 ·01	1 73 ·01	1[illegible]·0 ·0	T	4 10 ·61	·62 14	·1[illegible] 25	216[illegible] ?	SE b S	1	[illegible] 15	1,12[illegible] 5[illegible]	1 50 ·05	1·049 ··

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS

This Table is an Abstract of the Detailed Tables XLVII. to XLIX with additions

The upper line of each Series shows the "Mean Results"; the second line shows the "Ranges" of the Results.

	1			2				3				4		6	7	8	
SITES	Detailed Table	Serial No	Number of Sets	Gauge Reading	Hyd. Mean Depth	Surface Breadth	Wood (W) Tin (T) Rod	Surface Fall: Upper Sub Reach	Surface Fall: Middle Sub-Reach	Surface Fall: Lower Sub Reach	Surface Fall: Surface Slope (Left & Both Banks)	Average Wind: Direction	Average Wind: Velocity	Mean Velocity past centre vertical	Cubic Discharge	Mean Velocity	Ratio V — U₀
				h	R	b		F_1	F_2	F_3	S			U_0	D	V	c
SOLANI EMBANKMENT, MAIN SITE	XLVII.	171	3	3 02 10	4 72 08	150 0 0	T	3 65 04	24 00	05 10	?038 L ?	S	9	84 11	643 2 104 2	86 12	1 024 ..
		172	[illegible]	3 58 13	4·68 11	150 0 0	T	3 41 03	20 13	05 00	?	SSW	0	6 15	483 3 65 9	66 07	985 ..
		173	5	3 47 05	3 80 04	150 0 0	T	4 29 10	41 02	09 05	088 L 010	E b S	0	1 36 11	820 5 58 3	1 35 09	993 .
		174	1	3 04	4 30	150 0	T	4 59	51	60	125 L	..	0	1 38	887 6	1 34	971
		175	5	2 90 05	4·07 04	150·0 0	T	5 03 05	1 17 05	1·40 00	215 L 000	W b N	2	1 67 05	1,142 34	1 79 07	1·072 ..
	XLVIII.	176	2	2 83 01	3 28 01	150 0 0	T	5 03 06	70 01	·30 00	?242 L ?163	E b N	0	1 64 00	839 9 5 6	1 65 00	1·006 ..
		177	4	2 42 16	3 64 15	150 0 0	T	5·02 12	1 08 17	1 15 32	?193 L ?015	E b N	0	1 40 14	852 116 4	1 50 16	1 071 ..
		178	2	2 43 25	3 64 22	150 0 0	T	4·36 55	32 10	18 15	?	SSE	4	75 05	457 [illegible] 24 0	81 10	1·080 ..
		179	4	1 92 16	3 18 15	150 0 0	T	5 19 01	1 07 11	88 05	?180 L ?	ENE	1	1 15 0	[illegible] 93 4	1 27 13	1 104 ..
		180	[illegible]	1·67 05	2 26 04	150 0 0	T	5 72 35	39 35	10 00	148 L 050	NW	1	98 06	300 28 3	87 06	838 ..
		181	1	35	1 69	150 0	W * T	7 58	59	7 06	090 L	S	6	41	114 1	44	1 073
FIFTEENTH MILE Old Site	XLIX.	191	1	15 31	9 49	174 9	T	2 28	3 63	5 51	240 L	NE	2	4 55	7,184	4 16	914
		192	6	14 32 07	8 64 06	174 9 0	T	2 96 05	3 65 03	4 87 10	231 L 033	N	1	4 25 70	6,19[illegible] 60	3 98 39	936
		193	3	13 99 08	8 35 07	174 9 0	T	2·30 08	3·60 08	4 73 05	227 L 007	NNW	2	4 0[illegible] 11	5 780 114	3·87 04	956 .
		194	[illegible]	13 60 24	8 09 21	174 9 0	T	2 27 01	3 66 06	4 40 30	231 L 005	SW	1	4 1[illegible] 00	5,62[illegible] 179	3·93 01	942
		195	1	12 [illegible]3	7 13	171·3	T	2·06	3·79	3·65	?	N	4	3 60	4 370	3 5[illegible]	[illegible]
New Site.		196	[illegible]	15 16 10	8 67 08	185·9 3	T	2 26 07	3·65 07	5·37 22	?221 ?011	W	1	4 35 2	6,85[illegible] 115	4 12 03	947
		197	1	14 69	8·35	184 2	T	2 19	3 66	5 [illegible]0	220	SW	7	4 29	6,25[illegible]	3·98	928

* Wood Rods < 1 long Tin Rods of 1 and 1½ length

ABSTRACT TABLE 16.

MEAN VELOCITY-CURVES—ABSTRACT OF RESULTS.

This Table is an Abstract of the Detailed Tables L to LV with additions

The upper line of each Series shows the "Mean Results"; the second line shows the "Ranges" of the Results.

SITES	1			2				3			4		6	7	6		9
	Detailed Table	Serial No	Number of Sets	Gauge-Reading A	Hyd Mean Depth R	Surface-Breadth b	ROD Tin (T)	SURFACE-FALL Upper Sub Reach F₁	Lower Sub Reach F₂	Surface-Slope (Both Banks) S	AVERAGE WIND Direction	Velocity	MEAN VELOCITY past centre vertical U₀	CUBIC DISCHARGE D	MEAN VELOCITY V	Ratio V—U₀ c	SILT DENSITY (on centre vertical) σ
BELRA.	L	201	5	7 44 25	9 02 26	188 4 2	T	? 70 ?	?3 98 ?	191 025	S	1	3 24 31	5,611 395	3 17 27	978 ..	?319 ?954
		202	7	7 03 26	8 72 23	188 0 ·3	T	? 82 ?	?3 70 ?	200 030	NNW	2	3 19 38	5,329 282	3 12 19	978 ..	600 2,918
		203	9	6 80 20	8 47 33	187 8 2	T	? 90 ? 63	?3 51 ? 31	?191 ?050	S	1	3 19 64	5,112 558	3·09 29	969 ..	436 948
	LI.	204	14	6 49 26	8·21 20	187 5 3	T	79 83	3 23 56	198 075	N	1	3 07 47	4,810 223	3 01 20	980 ..	304 1,203
		205	6	6 30 16	7 96 28	187 3 2	T	87 35	3 15 40	208 020	NW b N	1	3 10 26	4,766 108	3 07 04	990 ..	202 495
		206	12	5 84 30	7 60 31	186·8 3	T	·79 34	2 74 70	?200 ?030	N b E	1	2 99 64	4 297 518	2 92 27	977 ..	601 5,185
JAOLI	LII.	211	9	7 21 25	7 82 27	192 8 3	T	39 23	?5 49 16	?174 ?032	NW b W	2	3 05 50	4 631 397	2 96 19	970 .	Not observed
		212	6	6 71 ·26	7 46 28	192 3 2	T	32 06	5 14 12	160 026	W b S	5	3 05 51	4,357 353	2 94 23	964 ..	
		213	7	6 45 26	7 22 33	192 0 2	T	29 12	4·80 96	?148 ?029	N b W	2	3 04 35	4,105 286	2·87 21	944 ..	
		214	8	6 21 18	7 05 16	191 6 1	T	28 09	4 70 66	140 030	WNW	6	2 94 44	3 925 184	2 81 15	956 ..	
	LIII.	215	10	5 97 25	6 79 32	191 5 2	T	25 23	4 53 1 09	145 037	W b S	7	2 93 35	3 740 358	2 80 27	956 .	
		216	9	5 64 22	6 53 21	191 2 2	T	27 20	4 19 74	144 030	W b N	7	2 9 45	3,475 362	2 70 27	928 ..	
		217	6	5·36 21	6 32 17	190·9 2	T	21 05	3 76 77	140 011	WSW	6	2 84 24	3,25 92	2 63 04	926 ..	
KAMHERA.	LIV.	221	4	6 46 22	4 64 17	65·5 2	T	2 83 08	11 80 21	295 006	NNW	9	3·09 43	960 6 33 8	2·86 05	926 ..	Not observed
		222	15	6 07 23	4 50 34	65 2 1 4	T	2 97 30	11 54 23	291 041	N b W	6	2·94 51	871 0 96 8	2 82 22	959 ..	
		223	11	5 79 24	4 37 33	64 8 1 2	T	2 84 40	11 24 78	297 028	NNW	9	2 88 56	831 5 75 5	2 79 26	·969 ..	
	LV.	224	12	5·53 16	4 18 12	64·3 5	T	2 79 26	11 12 25	304 022	NNW	4	2 91 25	772 7 64 9	2·74 21	942 .	
		225	14	5·34 14	4·07 13	64·0 5	T	2 73 13	10 64 32	307 015	N b W	3	2 77 54	730·4 65 5	2 71 16	978 ..	

ABSTRACT TABLE 19.

TRIAL TRANSVERSE CURVES

Length of Base Transversal = 2b from $y = -b$ to $y = +b$. Abscissæ (y) are reckoned of same sign as b so that $\frac{y}{b}$ is always +

The Table shows the values of the ordinates $\left(\frac{x}{x_0}\right)$ corresponding to the fractional abscissæ $\left(\frac{y}{b}\right)$

$\frac{y}{b}$	Parabolic $\frac{x}{x_0} = 1 - m\left(\frac{y}{b}\right)^n$ when m = 1								Elliptic $\left(\frac{x}{x_0}\right)^n + m\left(\frac{y}{b}\right)^n = 1$ when m = 1					EXPONENTIAL			
	n = 1	n = $\frac{3}{2}$	n = 2	n = 3	n = 4	n = 5	n = 6	n = 8	n = 1	n = 2	n = 3	n = 4	n = 6	Logarithmic	Error	Catenary	Equations
0	1 00	1 0000	1 0000	1 0000	1 0000	1 0000	1 0000	1 0000	1 00	1 000	1 000	1 000	1 000	1 0000	1 0000	1 0000	*Logarithmic curve* $\frac{x}{x_0} = m\,\epsilon^{-\eta}$ when m = 1 *Error Curve* $\frac{x}{x_0} = m\,\epsilon^{-\eta^2}$ when m = 1 *Catenary* $\frac{x}{x_0} = m\left\{2 - \frac{1}{2}\left(\epsilon^{\eta} + \epsilon^{-\eta}\right)\right\}$ when m = 1 [Here η is put for abscissæ for $\left(\frac{y}{b}\right)$]
1	90	9684	9900	9990	·9999	1 0000	1 0000	1 0000	90	·995	1 000	1 000	1 000	9048	9901	9950	
2	80	9106	9600	9910	9 84	9997	9999	1 0000	80	980	997	1 000	1 000	8187	9608	9799	
3	0	8357	·9100	9730	9919	9976	9993	9999	70	954	991	998	1 000	7408	9139	9546	
4	60	74 0	8400	·9360	9744	9898	9959	9993	60	917	9 8	994	999	6703	·8521	9199	
5	50	6464	7500	8750	·9375	9687	9844	996	50	866	956	984	997	6065	7788	·8724	
6	40	5351	6400	7840	8704	·9222	9533	9832	40	800	922	966	·99	5488	6977	8145	
7	30	4 43	5100	6570	7599	83 9	8824	9424	30	714	869	934	9 9	4966	6126	7448	
75	25	3505	4375	578	6836	627	8220	8999	25	661	833	909	968	4724	5698	7053	
8	20	2845	3600	4880	5904	6723	3 9	8322	20	600	787	877	951	4493	5273	6626	
85	15	2 61	2 75	3859	4 80	5563	6228	7275	15	527	728	812	924	4274	4855	6165	
9	10	1461	900	2710	3439	4095	4686	5695	10	436	647	766	881	4066	4449	5669	
95	·05	074	0975	1426	1855	2262	2649	3366	05	312	523	656	80	3867	·4036	5138	
96	04	0394	0784	1153	1507	1846	2172	2787	04	280	487	613	775	3829	3979	5027	
97	03	0447	0591	0873	1 47	14 3	1670	2162	03	243	444	582	42	3 91	3100	4915	
98	·02	·0298	0396	0588	·07 6	096	2142	1492	02	191	389	528	696	3753	3040	4801	
99	01	·0 50	0199	0297	·0394	0490	0585	0772	01	41	310	446	623	3716	2981	4686	
1 00	00	0000	0000	·0000	·0000	0000	0000	0000	00	·000	000	000	000	3679	3679	4569	

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS. ABSTRACT TABLE 20.

This Table is an Abstract from the Detailed Comparison Tables LVIII to LXI with the addition of Bazin s and Kutter's Co-efficients

Two lines are in general devoted to each Series. The upper line shows the "Mean Results" throughout; in Series of more than one Set the second line (old brevier type e.g 137) shows the " Ranges

	1		2							3							4							5							
			CONTROL					SURFACE FALL.		ROD-VELOCITY RESULTS							CENTRAL SURFACE-VELOCITY RESULTS.							SURFACE-SLOPE RESULTS							
			Head of Reach			Tail of Reach.							AVERAGE WIND						AVERAGE WIND			Ratio V — v_o			AVERAGE WIND				Ratio V — w		
SITE.	Serial No.	Number of Sets (Cols 3 6)	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator.	Withdrawn by Distributaries.	Average Obstruct on	Upper 5 miles	Lower 4½ miles	Hyd. Mean Depth	Surface-Breadth.	Length of Rod.	Direction.	Velocity.	CUBIC DISCHARGE in cub feet per sec.	MEAN VELOCITY	Number of Sets	Hyd Mean Depth	Direction	Velocity	CENTRAL SURFACE VELOCITY	Experl	Bazin s Rule	Hyd Mean Depth	Direction.	Velocity	Surface Slope (L. or R. Bank)	Value of 100 $\sqrt{RS}$	Experl	Bazin s	Kutter s
						Q	k	F_1	F_2	R	s	l			D	V		R			v_o	c	c_b	R			S	w	C	C_b	C_k
SOLANI LEFT AQUEDUCT	101	3	0 0	0 0	0 0	241 33	00 00	5 97 03	5 49 14	7 94 05	82 2 5	9 0	SE b E	1	3,406 32	4 06 09	No Observations							7 94 07	NE	1	180 L 012	3 88 11	1 048 014	1 11 .	1 050 ..
	103	4	0 0	0 0	0 0	143 53	00 00	5 91 16	5·05 51	7 65 07	82 5 0	8 9 5	SW b W	3	3,004 02	3 87 09	No Observations						..	7 64 07	SSW	4	207 L 017	3 98 17	978 057	1 11 ..	1 041 ..
	105	2	0 0	0 0	0 0	73 146	00 00	5 90 07	4 64 ·20	7 19 09	84 1 1	8 0	W b N	2	2 705 152	3 79 16								7 21 05	NW	1	222 L 007	4 00 07	926 024	1 10	1 032
	106	3	0 0	⅔ 2	0 0	57 113	·00 00	5 86 11	4 29 19	6 81 15	85 0 0	7 5 0	SE	2	2,390 137	3 49 11	1	6 75	N b E	4	4·05	847	786	6 81 15	SE	3	206 L 32	3 74 34	933 055	1 10 ..	1 024 ..
	107	4	0 0	0 0	0 0	0 0	·00 00	5 91 05	3·93 06	6 43 05	85 0 0	7 0	SW b W	1	2,513 47	3 46 06	No Observations						..	6 43 ·04	SSW	4	225 L 015	3 81 11	900 028	1 10	1 014 ..
AQUEDUCT open.	108	10	0 0	½ 2	0 0	233 208	7 00 7 00	5 86 17	7 59 7 25	7 96 10	82 1 5	9 2 5	NE	1	3,429 335	4 06 39	7	7 97 10	ENE	1	4 52 16	864 047	805 ..	7 96 10	SW	2	190 R 030	3 89 29	1 045 145	1 11 .	1 050 .
	109	1	0	0	0	318	00	6·07	5 25	7 82	82 5	9	N b W	4	3 577	4 35	.	No Observations					..	7 80	Calm		198 R	3 93	1 107	1 11	1 046
	109	9	0 0	⅖ 3	0 0	212 244	7 00 7 00	5 86 34	5 20 62	7 70 10	82 5 0	9 0	NE b E	5	3 164 312	3 88 34	8	7 77 10	NE	2	4 44 41	874 060	799	7 76 10	E	3	192 R 018	3 86 19	1 006 056	1 11	1 046 ..
	110	1	0	0	0	333	00	6·21	4 94	7 63	82 5	8 5	Calm.		3 385	4 24	1	7 66	N	1	4 78	887	809	7 67	N	1	203 R	3 95	1 073	1 11	1 042
	110	10	0 0	2 5	0 0	200 174	7 00 7 00	5 87 33	5 23 25	7 62 07	82 8 7	9 5	SSW	1	3 049 285	3 85 27	7	7 63 20	Calm		4 34 23	877 053	798 ..	7 64 20	SW	3	193 R 020	3 84 16	1·004 091	1 11 .	1 043
	110	1	0	0	0	0	00	5 75	5 10	7 56	83 1	9	N	7	2 838	3 61	1	7 58	Calm		4 39	822	793	7 58	Calm		183 R	3 73	968	1 11	1 044
	111	8	0 0	0 0	0 0	140 305	7 00 7 00	5 91 19	4 87 52	7 43 08	83 6 1	8 3 5	NE b N	2	2 950 263	3 8 37	6	7 42 07	NW	1	4 40 29	885 046	801 ..	7 43 08	NW	2	193 R 023	3 79 22	1 021 092	1 11	1 039

SOLAVI RIGHT Left Aqueduct	112	3	0 0	0 0	0 0	148 298	2 00 2 00	5 94 09	4 56 33	7 13 17	84 1 2	8 0	NW	2	2 761 215	3 80 18	1	7 11	Calm		4 43	847	798	7 12 22	NW	1	204 R 027	3 8 23	999 101	1 10	1 031
	113 114 115	6	0 0	1 6	0 0	102 261	7 00 2 00	5 00 30	4 20 26	6 75 25	84 4 1	7 3 5	SSE	1	2,529 222	3 73 26	4	6 73 14	Calm.		4 19 40	881 028	798	6 76 25	SE	1	205 R 033	3 72 34	1 001 101	1 10	1 023
	116	5	0 0	0 0	0 0	57 287	18 02	5 35 15	3 71 1 05	6 40 11	84 5 0	7 0	SW b W	1	2 79 93	3 60 13	1	6 34	V	*l*	4 03	896	796	6 40 11	S	1	207 R 010	3 65 08	989 057	1 10	1 014
	117	2	0 0	0 0	0 0	215 128	2 00 2 00	6 06 12	3 19 1 18	6 14 02	85 0 0	6 3 5	NE b N	2	2 209 73	3 6 13	2	6 14 06	NE b E	1	4 02 04	912 023	798	6 15 08	N	2	290 R 021	3 68 15	998 005	1 10	1 008
	118	4	0 0	0 0	0 0	120 212	2 47 2 00	6 00 12	8 29 49	5 86 16	85 0 0	6 0	NNE	3	20 8 155	3 61 17	4	5 86 17	S	1	4 06 32	890 054	797	5 86 17	V	*l*	225 R 015	3 63 17	994 042	1 10	1 000
	118	6	2¼ 12	1½ 10	0 0	95 234	2 55 2 83	6 46 49	2 5 1 12	5 43 23	85 0 0	5 4 5	NNE	1	1 999 113	3 69 23	5	5 45 23	V	*l*	4 34 171	878 064	805	5 44 23	N	1	234 R 093	3 55 72	1·046 232	1 09 ..	987
	119	1	0	0	0	0	00	6 97	2 93	5 41	85 0	6 5	Calm.		2 107	4 04		No Observations						5 32	Calm		313 R	4 08	990	1 09	981
	121	2	0 0	0 0	0 0	117 234	1 08 2	6 25 15	2 31 1 55	5 00 04	85 0 0	5 0	S	2	1 633 12	3 43 06	2	5 01 02	Calm		3 90 14	880 016	800	5 01 02	Calm		240 R 120	3 44 80	1 012 238	1 08	975
	122	3	0 0	0 0	0 0	23 2	87 00	5 66 03	1 72 05	4 05 04	85 0 0	4 0	S b W	7	1 07	3 73 02	2	4 04 02	SW b S	4	3 05 05	900 014	789	4 06 06	V	*l*	205 R 023	3 88 14	949 039	1 06	941
	122	3	5 15	3½ 10	6½ 10	58 173	2 00 2 00	6 43 82	71 9 7 50	4 00 08	85 0 0	3 8 5	ENE	2	1 223 23	3 26 06	3	4 03 12	E b N	1	3 75 07	870 004	795	4·02 06	N	2	278 R 057	3 33 45	982 111	1 08	939
	124	1	8	0	8	0	2	6 61	1 29	8 26	85 0	3	N	5	722 2	3 43	1	3 34	Calm		2 90	838	788	3 42	Calm		195 R	3 58	949	1 05	913
	125	1	3	0	10	0	00	7 78	42	1 95	85 0	1 5	S	*l*	276 0	1 61	1	1 98	S	*l*	1 85	880	780	2·00	Calm		203 R	2·01	801	98	818
	127	1	18	0	10	0	50	7 40	2 00	60	84 3	5	S	10	355 6	60		No Observations						74	S	11	113 R	·91	660	81	016
SOLAVI RIGHT AQUEDUCT Left Aqueduct closed.	131	2	0 0	0 0	0 0	247 0	14 30 7 00	3 60 00	10 00	4 20 00	85 0 0	4 0	NE	2	481 9 19 5	1 74 05	2	4 19 03	NE	3	1 48 11	838 028	827	4 17 07	NE	3	025 R 002	1·02 04	1 211 002	1 06	1 140
	132	2	0 0	0 0	6 0	159 0	2 2	6 17 00	9 00	3 65 04	85 0 0	3 0	Calm.		1 623 51	4 8 09	2	3 68 03	Calm		5 74 11	849 001	820	3 68 03	Calm		473 R 015	4 17 08	1 157 000	1 05	1 033
	135	1	0	0	8	71	1 33	6 22	6	2 99	85 0	2 5	Calm		865 6	3 20	1	3 03	Calm		3 60	889	820	3 04	Calm		253 R	2 77	1 155	1 04	1 051
	136	1	0	0	8	71	1 33	6 28	62	2 94	85 0	2 5	Calm		740 2	2 9	1	2 95	Calm		3 44	811	817	2 92	Calm		208 R	2 46	1 134	1 04	1 044
	137	1	0	0	8	78	7	6 4	43	2 94	85 0	3	SW	6	667 8	2 5	1	2 89	Calm		3 19	787	806	2·85	Calm		200 R	2 39	1 050	1 03	1 039
	138	1	0	0	8	78	7	6 52	16	2 72	85 0	2	Calm		690 7	2 54	1	2 68	Calm.		2 83	·882	837	2 61	Calm		145 R	1 95	1·303	1 02	1 020
	139	2	0 0	0 0	8 0	50 0	1 21 00	5 0 11	16 11	2 52 10	85 0 0	2 0	S	1	496·3 55 6	2 20 1	2	2 59 09	S b W	3	2 54 25	863 018	81	2 53 12	V	*l*	151 R 035	1 95 28	1 132 069	1 01	1 014

ABSTRACT TABLE 21.

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS

This Table is an Abstract from the Detailed Comparison Tables LXII to LXIV with the addition of Bazin's and Kutter's Co-efficients

Two lines are in general devoted to each Series The upper line shows the Mean Results throughout In Series of more than one Set the second line (old brev er type, as 182) shows the "Ranges"

	1		2								3						4								5							
			CONTROL.					SURFACE FALL.			ROD-VELOCITY RESULTS						CENTRAL SURFACE-VELOCITY RESULTS							SURFACE-SLOPE RESULTS							
			Head of Reach			To 1 of Reach							AVERAGE WIND						AVERAGE WIND.			Ratio V — v_0			AVERAGE WIND				Ratio V ÷ w		
SITE	Serial No	Number of Sets (Col. 3 5)	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by tributaries	Average Obstruction	Upper 4 miles	1 mile below Site	Lower 4½ miles	Hyd. Mean Depth	Surface-Breadth	Direction	Velocity	Cubic Discharge c. ft. per sec.	Mean Velocity	Number of Sets	Hyd Mean Depth	Direction	Velocity	Central Surface Velocity	Experl	Bazin's Rule	Hyd. Mean Depth	Direction	Velocity	Surface-Slope (Left Bank	Value of 100 $\sqrt{RS}$	Experl	Bazin's	Kutter's
						Q	k	F_1	F_2	F_3	R	b			D	V		R			v_0	c	c_b	R			S	w	C	C_b	C_k
SOLANI EMBANKMENT MAIN SITE High Water	151	5	0 0	0 0	0 0	263 2	·00 ·00	4 70 09	1 25 10	5 46 20	9 34 07	170·0 1·2	ESE	4	7 169 424	4 02 20	2	9·35	SE	3	4 66 09	·881 013	775	9·34 09	ESE	5	227 007	4 60 09	·872 047	907 ·	877 ·
	152	10	0 0	1 1	0 0	226 162	7 00 7 00	4 70 13	1 15 18	5 58 50	9 19 10	170 6 1 2	SSE	4	6 743 545	3 83 26	10	9 20 15	ESE	3	4 52 29	849 067	777	9 20 15	Calm.		205 020	4 34 21	884 084	905 ··	877 ··
	153	5	0 0	2 2	0 0	149 183	7 00 7 00	4 72 21	1 20 15	5 13 72	8 94 12	168 7 0	W b S	4	6 712 132	3 68 05	4	8·94 12	W b S	6	4 30 50	838 102	764 ·	8 92 10	W	4	297 069	4 50 59	821 120	901	871 ··
	154	5	0 0	0 0	0 0	206 182	00 00	4 08 10	1 29 02	4 81 12	8·69 13	167 1 1 2	SW b S	2	5 974 425	3 71 18	2	8 71 13	S	3	4 47 23	833 002	767	8 69 13	W	1	229 038	4 46 40	832 045	897 ··	868 ··
	155	6	0 0	0 0	0 0	104 240	00 00	4 72 40	1·26 14	4·65 30	8 47 ·24	166 3 0	W	5	5 564 1,141	3 5 65	5	8 46 05	W	5	4 31 89	836 075	767	8 44 18	W	5	217 049	4 28 52	835 072	893 ··	864 ··
	156	1	0	0	0	22	7 00	3 91	2·06	3 9	8 25	165 2	E	4	4 930	3 26	1	8 25	Calm		3 94	827	750	8 25	Calm		223	4 29	760	889	861
	157	4	0 0	1 2	0 0	34 113	00 00	4 63 06	1 25 ·05	4 30 19	8·07 16	164·0 0	SE b S	1	4 810 476	3 31 46	4	8 07 16	SE	1	4 02 21	835 061	760 ·	8 01 16	SE	2	212 028	4 13 23	804 082	885 ··	858 ··
	158	2	0 0	0 0	0 0	196 3	7 00 7 00	4 81 15	1 25 15	4 25 25	7 84 05	164 0 ·0	W	3	4 861 65	3 4 01	2	7 79 01	Calm.		4 25 10	806 016	768	7 79 03	Calm		215 000	4 10 01	837 005	881	853 ·

SOLANI EMBANKMENT MAIN SITE

High Water	159	7	½ 1	0 0	0 0	89 219	? 00 ? 00	4 86 1 02	1 25 19	3 95 15	7 65 09	162 6 1 1	SSW 1	4 608 325	3 29 21	3	7 67 12	Calm	4 45 04	814 010	762 ..	7 66 14	SW b W 2	243 010	4 05 08	812 048	878 ..	849 ..
	160	6	0 0	0 0	0 0	18 62	00 00	4 67 18	1 32 07	3 51 22	7 26 18	161 3 1 2	W b S 4	4,120 90	3 22 10	2	7 28 13	W 4	3 64 15	890 012	763 ..	7 26 14	W 6	214 010	3 94 10	817 044	870 ..	843 ..
	161	5	0 0	0 0	0 0	9 22	00 00	4 65 05	1 30 05	3·30 50	7 12 12	159 3 0	S b E 4	3,663 155	3 11 12	1	7 14	Calm	3 69	851	755	7 12 ·12	SSE 2	217 006	3 93 06	792 022	867 ..	841 ..
	162	5	0 0	0 0	0 0	12 22	? 00 ? 00	5 10 33	1 14 17	3 15 30	6 78 22	159 3 0	SE b E 2	3 973 342	3 39 37	5	6 80 20	S 1	4 01 86	847 093	779 ..	6 79 21	S 2	221 125	3 85 1 11	893 302	859 ..	833 ..
	163	6	0 0	0 0	0 0	0 0	? ?	5 11 10	1 23 01	2 62 14	6 18 12	157 0 0	WSW 2	3,194 237	3 05 20	6	6 19 11	N b E 1	3 60 16	849 076	788 ..	6 19 10	Calm	171 050	3 25 45	943 158	844 ..	824 ..
	165	4	0 0	0 0	0 0	214 0	? ?	4 77 28	85 24	1 2 10	5 72 13	154 7 0	NE b N 1	2,371 264	2 51 24	4	5 72 13	Calm	2 94 22	859 053	765 ..	5 72 13	Calm	161 040	3 04 39	824 065	830 ..	813 ..
	166	1	0	0	0	172	?	4 87	88	1 35	5 39	152 3	E 6	2,100	2 40	1	5 40	Calm	2 81	854	766	5 40	Calm	155	2 89	830	820	804
Low Water	167	2	0 0	0 0	0 0	77 121	? 50 ?	4·68 05	90 30	1 50 40	5 03 05	151·8 1 1	SE b S 2	1,723 73	2 13 14	2	5 03 06	Calm	2 36 00	903 059	727 ..	5 03 00	Calm	195 020	3 13 18	676 072	807 ..	605 ..
	169	2	9 0	0 0	0 0	60 1	? ?	4 69 04	1 21 56	·70 60	4 83 03	150 0 0	Calm	1,445 49	1 89 ·05	2	4 83 03	Calm	2 03 06	929 052	714 ..	4 83 02	Calm	200 000	3 11 00	607 015	799 ..	659 ..
	170	1	9	0	0	130	?	4 40	70	·60	4 72	150 0	Calm	1,152	1 54	1	4 70	V 1	1 82	840	685	4 76	Calm	165	2 80	550	797	657
	171	1	0	0	0	263	14 10	3 66	24	10	4 76	150 0	S 11	704 9	95	1	4 76	S°E 4	92	1 011	731	4 76	SE 5	038	1 35	680	797	·679
	173	5	0 0	0 0	8 0	232 0	2 08 00	4 29 ·10	41 02	·09 05	3 86 04	150 0 0	E b S 8	820 5 58 3	1 35 03	4	3 86 03	E 2	1 54 04	874 049	·743 ..	3 87 04	Calm.	088 010	1 84 11	734 ·052	757 ..	631 ..
	174	1	0	0	0	106	?	4 59	51	60	4 20	150·0	Calm	687 6	1 34	1	4 33	Calm	1 52	882	694	4 34	Calm	125	2 33	575	779	647
	175	1	0	0	0	0	?	6·06	1 14	1 40	4 05	150·0	Calm.	1,165	1 82	1	4 03	Calm	1 36	978	709	4 03	Calm	215	2 94	618	765	633
	176	2	4½ 3	0 0	8 0	104 10	1 76 66	5 03 00	·70 01	30 00	3 28 ·01	150 0 0	r b N 6	839 9 5 6	1 65 00	1	3 26	NW 3	1 79	922	708	3 28 01	E 4	?242 ?163	?2 78 ? 03	? 613 ? 215	724 ..	·604 ..
	177	3	0 0	0 0	0 0	0 0	? ?	5·01 ·11	1·06 17	1 17 ·32	3 62 ·15	150 0 0	E b N 9	835·5 77 7	2 48 09	3	3 62 15	NE 1	1 55 11	·953 049	688 ..	3·62 16	E 1	193 015	2 65 16	558 023	744 ..	·618 ..
	179	1	0	0	0	0	?	5 18	1·02	90	3·11	150 0	Calm	583 7	1 21	1	3 11	Calm	1 26	961	668	3 11	Calm.	180	2 37	·511	713	596
	180	2	0 0	0 0	9 0	19 4	1 24 00	6 72 35	39 33	10 00	2 26 04	150 0 0	NW 1	300 9 28 3	8, 06	2	2 24 00	E 1	94 15	965 094	654 ..	2 25 01	NW 1	148 005	1 82 04	478 022	646 ..	547 ..
	181	1	13	0	10	0	67	7 38	·39	? 0	1 69	150·0	S 6	114 1	44	.	No Observations				..	1 73	S 11	000	1 25	352	591	501

ABSTRACT TABLE 22.

CENTRAL SURFACE AND MEAN VELOCITIES—ABSTRACT OF RESULTS

This Table is an Abstract from the Detailed Comparison Tables LXV to LXIX. w th the addition of Bazin s and Kutter s Co-efficients

Two l nes are in general devoted to each Series. The upper line shows the "Mean Results" throughout; in Series of more than one set the second line (old brevier type as 108) shows the "Ranges."

[Lengths of Sub Reaches as f ws (in miles):—F fteenth Mile S tes 2, 3, 4½ Raira, 1 4; Jacil [5 Kambera, 2½ 4½]

SITES	1		2								3						4							5							
			CONTROL					SURFACE FALL			ROD VELOCITY RESULTS						CENTRAL SURFACE-VELOCITY RESULTS							SURFACE-SLOPE RESULTS							
			Head of Reach			*Tail of Reach*							AVERAGE WIND						AVERAGE WIND			Ratio V — v_c			AVERAGE WIND				Ratio V — w		
	Serial No	Number of Sets (Cols 3, 5)	Gates open in Dam	Ogees open in Dam	Gates closed in Regulator	Withdrawn by Distributaries Q	*Average* Obstruct on k	Upper Sub-Reach F_1	M ddle Sub-Reach F_2	Lower Sub-Reach F_3	Hyd Mean Depth R	Surface-Breadth b	Direct on	Velocity	CUBIC DISCHARGE in cub feet per sec. D	MEAN VELOCITY V	Number of Sets	Hyd Mean Depth R	Direction	Velocity	CENTRAL SURFACE VELOCITY v_c	Experl c	Bazin s Rule c_b	Hyd Mean Depth R	Direction	Velocity	Surface Slope (L. or R. Bank) S	Value of $100\sqrt{RS}$ w	Experl c	Bazin s c_b	Kutter s c_k
FIFTEENTH MILE Old Site	191	1	0	0	0	123	00	2 28	3 63	5 54	9 49	174 9	NE	2	7 187	4 16	1	9 48	NW	1	4 91	·847	775	9 51	NW	1	240	4 77	872	910	878
	192	8	0	0	0	44	00	2 26	3·65	4 87	8 64	174 9	N	1	6,190	3 98	6	8 64	N	1	4 65	866	779	8 65	N	1	231	4 47	893	896	867
			0	0	0	115	00	05	08	10	08	0			602	39		06			17	·088	..	·06			033	32	107	.	..
	193	3	0	0	0	80	00	2 30	3 60	4 73	8 35	174 9	NNW	2	5 780	3 87	3	8 30	S	2	4 51	857	778	8 34	N	3	227	4 36	887	·891	862
			0	0	0	120	00	08	08	05	07	0			114	04		08			13	19	.	03			007	05	·012	..	..
	194	2	0	0	0	0	00	2·27	3 66	4 40	8·09	174 9	SW	1	5 622	3 93	2	8 01	Calm		4 61	871	783	8 02	SW	2	231	4 31	912	885	857
			0	0	0	0	00	01	06	30	21	0			179	01		22			11	014	.	23			005	01	000	.	..
	195	1	0	0	0	62	00	2 06	3 73	3 65	7 13	171 3	N	1	4,370	3 51	1	7 15	Calm		4·21	834	?	No Observations						.	..
New Site	196	3	0	0	0	288	00	2 26	3 65	5 37	8 67	185 9	W	1	6 857	4 12	3	8 67	SW	1	4 69	880	788	8 68	W	1	?291	?4 38	? 942	897	953
			0	0	0	0	00	07	07	22	08	3			115	03		04			16	028	..	09			?011	? 10	? 028	.	..
	197	1	0	0	?	115	00	2 19	3 66	5 20	8 35	184 2	SW	7	6 287	3 98	1	8 37	SW	7	4 52	881	786	8 35	SW	7	220	4 29	928	891	948
RA	201	5	Head		Head.	169	00	?70	Reach	?3 98	9 02	188 4	S	1	5 611	3 17	4	9·02	S	1	3 67	839	751	9 02	S	1	191	4 15	763	902	747
						230	00	? 05		? 15	26	2			398	27		24			14	053		26			025	28	047	..	..
	202	7				188	00	? 82		?3 70	8 72	188 0	NNW	2	5 529	3 12	7	8 73	NW	3	3 70	846	747	8 72	N b W	3	200	4 17	749	898	741
						298	00	? 32		? 22	23	3			282	19		20			20	040		23			030	27	032	..	..

BEL	203	9	No Dam at	No Regulator at	142 298	00 00	2 90 2 63	No middle Sub-	23 51 2 31	8 47 33	187 8 3	S	1	5,112 558	3 09 29	8	8 49 34	S	1	3 56 35	876 095	753	8 47 33	S	1	2191 2050	24 01 2 50	2 771 2 064	803	738 .
	204	14			124 230	09 09	79 83		3 23 56	8 21 20	187 5 3	N	1	4 810 223	3 01 20	13	8 20 19	N	1	3 47 27	868 081	74- .	8 21 20	N	1	198 075	4 03 72	747 121	889	733
	205	6			254 16	08 47	87 35		3 15 40	7 96 28	187 3 2	NW *b* N	1	4 766 108	3·07 04	6	7 96 28	NNW	1	3 53 18	870 043	748 ..	7 96 28	NW *b* N	1	208 020	4 07 18	754 037	884	728 ..
	206	12			183 108	19 56	79 34		2 74 70	7 60 31	186 8 3	N *b* E	1	4,292 518	2 92 27	12	7 59 31	N *b* W	1	3 39 26	862 073	74 .	7 60 31	N *b* E	1	2200 2030	23 90 2 37	2 749 2 087	877	723 ..
JAOLI	211	9	No Dam at Head	No Regulator at Head	53 75	7 00 7 00	·39 23	No middle Sub-Reach	75·4 7 16	7 82 27	192 8 3	NW *b* W	2	4 631 397	2 96 19	9	7 82 30	WNW	2	3 43 25	861 063	760	7 82 27	NW *b* W	2	2174 2032	23 69 2 35	2 802 2 058	881	859 ..
	212	6			43 90	00 00	89 06		5 14 12	7·46 28	192·3 2	W *b* S	5	4 357 353	2 94 23	6	7 46 24	W *b* N	5	3 32 24	886 088	771	7 46 28	W *b* S	5	160 026	3 44 29	853 040	874 .	854 .
	213	7			52 100	29 1 00	29 13		4 80 90	7 22 38	192·0 2	N *b* W	2	4 105 286	2 87 21	7	7 23 38	NNE	2	3 36 18	857 989	776	7 22 38	N *b* W	1	2148 2029	23 27 2 28	2 878 2 035	869	851 .
	214	8			35 80	00 00	28 09		4 70 66	7 05 16	191 8 1	WNW	0	3 920 184	2 8 15	8	7 04 13	W	7	3 27 22	860 086	778	7·00 16	WNW	0	146 030	3 21 33	878 065	865	648
	215	10			47 90	20 1 00	25 23		4 58 109	6 79 32	191 5 2	W *b* S	7	3 740 358	2 80 27	10	6 79 29	W *b* N	5	3 21 27	871 091	779 .	6 79 32	W *b* S	7	140 037	3 14 44	892 072	859 ..	842 ..
	216	9			44 95	44 1 00	27 20		4 19 74	6 53 21	191 2 2	W *b* N	7	3 473 362	2 70 27	9	6 53 21	WSW	0	3 14 18	863 100	777	6 53 21	W *b* N	7	144 030	3 06 30	883 088	852 ..	836 ..
	217	6			18 95	67 1 00	21 05		8 76 77	6 32 17	190 9 2	WSW	6	3 259 92	2 63 04	6	6 33 17	W *b* N	7	3 09 16	850 038	778 .	6 32 17	WSW	6	140 011	2 97 12	886 035	847 ..	832 ..
KAMHERA	221	4	No Dam at Head	2 closed, 1 open	101 3	1 26 00	2 83 08	No middle Sub Reach	11 80 21	4 84 17	65 5 2	NNW	9	960 6 35 8	2 86 05	4	4 84 17	NNW	9	3 40 28	842 087	749 .	4 84 17	NNW	9	295 008	3 78 04	757 017	800	781 ..
	222	15			03 18	1 26 00	2 97 30		11 54 23	4 50 34	65 2 1 4	N *b* W	6	871 0 98 8	2 82 22	15	4 50 34	N *b* W	5	3 32 40	848 074	755	4 50 34	N *b* W	6	291 041	3 62 18	779 088	788 ..	771 ..
	223	11			73 65	1 26 00	2 84 40		11 24 78	4 37 33	64 8 1 2	NNW	9	831 5 75 5	2 79 28	11	4 36 33	NNW	9	3 25 48	860 115	754 .	4 37 33	NNW	9	297 028	3·60 12	776 079	781 .	767 ..
	224	12			57 88	1 26 00	2 79 26		11 12 25	4 18 12	64 3 5	NNW	4	772 7 64 9	2 74 21	12	4 18 12	NNW	5	3 27 44	865 112	752 ..	4 18 12	NNW	4	304 022	3 56 10	769 045	772 ..	·776 ..
	225	14			69 82	1 26 00	2·73 13		10 64 82	4 07 13	64·0 5	N *b* W	3	739 4 65 5	2 71 18	14	4 07 13	N *b* W	3	3 30 30	·875 081	750 ..	4 07 13	N *b* W	3	306 019	3 53 09	760 ·045	787 ..	773 ..

ABSTRACT TABLE 23.

CUBIC DISCHARGE TABLE.

This Table shows the Cubic Discharge in the Roorkee, Belra, and Kamhera Reaches (for each half foot of the Standard Gauge* of the Reach) and also in the four Distributaries (a few cases only),—1°, according to the Results of these Experiments and 2°, to the official Canal Tables in use at the time.

* The "Standard Gauges are those used for the Canal Tables; their positions are shown in Plates I III IV.

ROORKEE REACH.			BELRA REACH			KAMHERA REACH			DISTRIBUTARIES			
Soláni Aqueduct Gauge	Soláni Embankment Main Site. (Present Experiments)	Soláni Aqueduct Site. (Canal Tables)	Belra Gauge.	Belra Site. (Present Experiments)	Belra Site (Canal Tables)	Kambera Bridge Gauge.	Kambera Discharge Site (Present Experiments)	Kambera Bridge Site (Canal Tables)	Name.	Gauge-Reading	Experimental Site, see Plate III. (Present Experiments)	Sites near Gauges (Canal Tables)
·5	?	119	5	No Experiments.	221	·5	No Experiments.	..	Right Jaoli.	3 1	98	105
1 0	123	236	1 0		443	1 0		..		4 3	191	166
1 5	?	440	1 5		665	1 5		Nil				
2 0	625— 260	642	2 0		887	2 0		12				
2 5	850— 327	926	2 5		1,297	2 5		48	Mansúrpur	3 6	73	60
3 0	1,180— 420	1,211	3 0		1,707	3 0		91		3 9	83	69
3 5	865— 490	1,49[illegible]	3 5		2 117	3 5		150		4 1	91	75
4 0	1,520—1,080	1,780	4 0		2,52[illegible]	4 0		231				
4 5	2,060— 480	2,105	4 5		2,787	4 5		318	Mírdnpur.	2 8	25	22
5 0	2,340	2,430	5 0		3 050	5 0		416		3 8	41	44
5 5	3,190	2,755	5 5		3,350	5 5		525				
6 0	3,584	3,105	6 0	4,410	3,700	6 0	690	643				
6 5	4,020	3,45[illegible]	6 5	4,810	4,143	6 5	770	769	Pimora.	3 3	50	48
7 0	4,170	3,805	7 0	5,325	4,590	7 0	860	903		3 8	63	57
7 5	4,880—4,460	4,155	7 5	5,655	5,033	7 5	970	1,044				
8 0	4,830	4,530	8 0	?	5,478	..	..	..				
8 5	5,470	4,905	..	..	..	..	..	..	.	..	..	..
9 0	6,010	5,305	..	..	..	..	..	..	..	.	..	..
9 5	6 300	5,705	..	..	..	..	..	..	..	..	..	..
10 0	7,270—6 770	6,105	..	..	..	..	..	..	..	..	..	..

ABSTRACT TABLE 24.

CUBIC DISCHARGE-VERIFICATION.

RANGE OF MEAN VELOCITIES IN EACH SERIES.

This Table shows the highest Mean Velocity and corresponding Gauge-Reading in every Series, and also the (actual and percentage) Range of Mean Velocity and Range of Gauge-Reading corresponding.

SITES	Serial No	Number of Sets	DEPTH: Gauge of max V	DEPTH: Range (max to min V)	MEAN VELOCITY: Maximum V	MEAN VELOCITY: Range, Actual	MEAN VELOCITY: Range, Percent (of max)
SOLANI LEFT AQUEDUCT	101	3	9 83	17	4 12	09	2 2
	102	12	9 50	00	3 73	26	7 0
	103	4	9·40	03	3 91	09	2 3
	104	12	9·15	25	3 69	16	4 3
	105	2	8 67	13	3 78	16	4 2
	106	6	8 19	22	3 54	20	5 7
SOLANI RIGHT AQUEDUCT (Left Aqueduct open).	112	[illegible]	[illegible]	[illegible]	[illegible]		
	113	1	..	..	..		
	114	20	7 95	00	3 76		
	119	7	6 13	17	4 04	46	11 9
	120	9	5 75	11	3 46	34	9 8
	121	2	5 58	05	3 46	·06	1 7
	122	13	4 35	14	3 35	66	19 7
	123	1	..	..	..	..	..
	124	1	..	..	..	..	..
	125	1	..	..	..	..	..
	126	1	..	..	..	..	..
	127	1	..	..	..	..	..
SOLANI RIGHT AQUEDUCT [L Aqueduct closed]	131	2	4·60	00	1 26	·05	4 0
	132	2	3 98	05	4 87	09	1 9
	133	1	..	..	..	..	..
	134	1	..	..	..	..	..
	135	1	..	..	..	..	..
	136	1	..	..	..	..	..
	137	1	..	..	..	..	..
	138	1	..	..	..	..	..
	139	2	2 71	11	1 28	17	7 5

HIGH WATER

SITE	Serial No	Number of Sets	DEPTH: Gauge of max V	DEPTH: Range (max to min V)	MEAN VELOCITY: Maximum V	MEAN VELOCITY: Range, Actual	MEAN VELOCITY: Range, Percent (of max)
	155	6	8 8	29	4·05	63	15 6

SITE	Serial No.	Number of Sets	DEPTH: Gauge of max V	DEPTH: Range (max to min V)	MEAN VELOCITY: Maximum V	MEAN VELOCITY: Range, Actual	MEAN VELOCITY: Range, Percent (of max)
	197	1	..	..	..	..	..

LOW WATER.

SITE	Serial No	Number of Sets	DEPTH: Gauge of max V	DEPTH: Range (max to min V)	MEAN VELOCITY: Maximum V	MEAN VELOCITY: Range, Actual	MEAN VELOCITY: Range, Percent (of max)
SOLANI EMBANKMENT	167	10	3 98	·10	1 20	·14	6 4
	168	1	..	..	..	..	..
	169	10	3 75	03	2 13	35	16 4
	170	2	3 63	01	1 54	08	5 2
	171						
	172						
	173						
	174						
	175						
	176	2	2 83	01	1 6	00	0
	177	4	2 47	14	1 58	16	10 1
	178	2	2·30	25	·86	·10	11 7
	179	4	2·00	15	1·34	13	9·7
	180	2	1 69	05	·90	06	6 7
	181	1	..	..	..	..	..

SITE	Serial No.	Number of Sets	DEPTH: Gauge of max V	DEPTH: Range (max to min V)	MEAN VELOCITY: Maximum V	MEAN VELOCITY: Range, Actual	MEAN VELOCITY: Range, Percent (of max)
JAOLI	211	9	7 28	·21	3 06	19	6 2
	212	6	6 68	08	3 05	23	7 5
	213	7	6 35	04	2·98	21	7 1
	214	8	6 26	06	2 89	·15	5 2
	215	10	5 96	·11	2 95	·27	9 2
	216	9	5 74	·09	2 84	27	9 5
	217	6	5 41	01	2 64	04	1 5
DISTRIBUTARIES	231	2	4 34	01	2 52	01	·4
	232	2	3 10	·01	2 10	·00	0
	233	4	4 05	20	2 14	11	5 1
	234	1	..	..	..	..	..
	235	1	..	..	..	..	..
	236	2	2 83	00	1 49	00	0
	237	2	2·78	·01	1 84	02	1 1
	238	2	3·37	09	1 79	08	4·5

ABSTRACT TABLE 25.

CUBIC DISCHARGE-VERIFICATION.

CASES OF HIGH MEAN VELOCITY RANGE (OVER 10 PER CENT) IN A SERIES.

The cases of high mean velocity are shown to left; followed by all cases of mean velocity = or < $\frac{9}{10}$ of the high values (in same Series). The External Conditions effecting them follow

SITES	Serial No	DATE or Number of Set	MEAN VELOCITY				DEPTH.		Length of Rod.	SURFACE FALL				WIND				PROBABLE CAUSES	
			High V	$\frac{9}{10}$ of high V (computed)	Number of cases = or < 9 × high V	Low V = or < $\frac{9}{10}$ of high V	Gauge-Reading H or h	Variation.	l	Upper Sub-Reach F_1	Middle Sub-Reach F_2	Lower Sub-Reach F_3	Surface-Slope S	From Direction.	From Velocity	To Direction.	To Velocity	of high velocity.	of uncertain results.
RIGHT AQUEDUCT.	108	14·12 '78	4 30	3 87	2	..	9 08	00	9	5 97	No Middle Sub-Reach.	5 55	173	S	9	?	?	Short Rod, high F_1	
		1-6-'77	..	..	..	3 84	10 00	00	8½	5 90		5 70	?	SE	3	E	11	.. ..	High wind.
		8 6- "	..	..	..	3 85	9 97	+ 01	9½	5 73		5 62	?	W	4	S	1	.. ..	
	109	23·7·'78	4 35	3 91	11	..	9 68	+ 05	9	5 07		5 23	196	..	0	S b W	8	High F_1	
		Nos. 2 to 4,	Max data of 11,			3 89	65	·12	9	5 94		5 43	719	NE	12	N	15	.. ..	
		& 10 to 17	Min data of 11.			3 74	50	00	9	5 73		4 95	718	..	0	..	0	.. ..	
	109	14 11·'77	4 28	3 85	4	..	9 64	+ 02	9	5 15		5 14	?	S	4	S	6	High F_1	
		Nos 3, 4, 14, 17	Max. data of 4,			3 84	65	·00	9	5 85		5 40	195	NE	12	NE	17	.. ..	
		" " "	Min. data of 4,			3 74	60	00	9	5 80		4 95	190	..	0	"	0	.. ..	
	109	14 11·'77	4 17	3 75	1	..	9 66	+ ·07	9	6 14		5 16	?	S	5	SSW	13	High F_1	High wind.
		3 5- "	..	..	..	3 74	65	00	9	5 80		4 95	190	NE	12	N	10	.. ..	High wind.
	110	8 8·'78	4 24	3 82	13	..	9 39	− ·03	8½	6 21		4 91	202	..	0	..	0	Short Rod, high F_1	
		Nos 1, 3, 4, 6, 11	Max, data of 13,			3 82	·42	05	9	5 11		5 27	7200	NE	10	N	13	.. ..	
		& 13 to 20	Min. data of 13,			3 61	25	·00	8½	5 76		5 10	7182	..	0	..	0	.. ..	
	110	28 5-'78	4 02	3 62	1	..	9 42	·00	9	5 98		5 12	186	NW	1	V	1	High F_1	
		26-4-'77	..	..	..	3 61	25	·00	9	5 75		5 10	183	..	0	N	13	.. ..	High wind.

SOLANI	116	9 7 '78	4 04	3 64	2	.	6 13	+ 25	5½	6 97	No Middle Sub Reach	2 93	313	.	0	..	0	Short Rod, high F_1 S	Canal not in train
		10 7- ..	..	..	.	3 63	11	+ 15	5½	6 79		2 41	273	N	6	V	15	.. ..	Water rose 15
		25-7-'76	..	..	..	3 56	30	00	6	6 40		3 10	240	..	0	..	0	.. ..	
	122	23 8 '78	3 35	3 02	10	..	4 35	+ 05	3½	6 05		1 95	260	..	0	N	5	Short Rod high F_1 F_2, S ?	
		22 7- 76	3-30	2 07	10	..	33	00	4	6 67		1 73	330	S	6	SE	4	High F_1, (and S ?)	
		23-8 '78	3 24	2 92	10	..	43	+ 05	4	6 37		2 23	243	N	7	E	8	High F_1, (and S ?)	
		Nos. 1 to 10	Max data of 10			2 88	57	05	4	5 68		1 79	?218	S	9	S	19	.. ..	
		" " "	Min data of 10,			2 69	40	00	4	5 61		1 70	?219.	..	0	..	0	.. ..	
SOLANI EMBANKMENT MAIN SITE	155	28 10 '78	4 95	3 65	5	..	8 82	·00	Longest possible in each Float-Course	5 01	1 34	4 45	218	..	0	..	0	High F_1, F_2, S ..	Change of soundings?
		Nos 1 & 3 to 6	Max data of 5			3 58	82	21		4 70	1 29	4 75	217	W	20	W	19	.. ..	
		" " "	Min. data of 5,			3 42	·53	00		4 61	1 20	4 48	199	Y	4	..	0	.. ..	
	156	9 9-'76	3 40	3 06	1	.	7 68	− 04		4 85	1 35	3 9.	215		0	S	14	High F_1 & F_2 ..	High wind
		27 2 '77	..	..	.	3·05	·40	00		4 57	1·23	3 90	?	S b W	7	W b S	25	.. ..	High wind
	162	24 10 '76	3 52	3 17	1	..	6 26	− 02		5 27	1 10	3 13	160	ENE	7	NE	4	High F_1, (& F_2 ?)	
		2-2-'78	..	..	..	3 15	49	− 01		4 94	1 26	2 9.	217	S	9	S	9	.. ..	
	165	10-10-'77	2 81	2 56	3	..	5·01	− 05		4 42	1 26	2 32	?	E b S	6	SW	7	High F_3 & F_4 ..	
		Nos 4 to 6	Max data of 3,			2 46	00	03		4 63	0 97	1 30	170	..	0	E	14	.. ..	
		" " "	Min data of 3,			2 38	4 86	00		4 67	0 73	1 20	15.	..	0	..	0	.. ..	
	169	8 2-'77	2 13	1 92	9	..	8 75	00		4 78	1 17	1 75	?	NE	8	S	15	High F_1 & F_3 ..	{ Canal not in train in Sets 4 to 10, see Table XLVI
		Nos. 1, 2, 4 to 10	Max data of 9			1 91	79	03		4 73	1 49	1·00	?200	NE	10	SW	19	.. ..	
		" " "	Min data of 9,			1 78	70	00		4 39	0 89	·40	?200	..	0	..	0	.. ..	
	171	31·10-'77	93	·84	2	..	3 67	+ 01		3 66	24	10	038	S	4	S	17	High F_4	High wind
		30 10- "	..	..	"	84	57	00		3 66	24	·00	?	E	10	S	9	.. ..	High wind
		" "	..	..	..	81	·61	+ 08		3·62	24	04	?	S	9	SW	18	.. ..	High wind
	172	26 10-'77	·69	62	1	..	3 64	·00		3·39	26	0.	?	SE	10	..	0	High F_2	
		22 10- "	..	.	..	·62	51	− 05		3 42	13	0.	?	NW	4	SW b W	10	.. ..	
	177	30 9 '76	1 58	1 42	1	..	2 47	+ 04		)5 06	1 14	1 10	?	NE	4	E	17	High F_2	High wind
		28-9- "	..	..	..	1 42	·33	− 03		5 05	1 00	1 13	18	E	12	E	27	.. ..	High wind
	176	16 10-'77	·86	77	1	..	2 30	·00		4 63	27	·10	?	..	0	SE	8	High F_1	
		" "	..	..	..	·76	·55	+ 10		4 08	37	2.	?	S b W	7	..	0	.. ..	Canal not in train.

CUBIC DISCHARGE-VERIFICATION.

ABSTRACT TABLE 26.

RANGE OF MEAN VELOCITY MEASUREMENTS OF SAME DAY, AT SAME SITE

[The + and − signs in Range Column indicate that the Mean Velocity increases or decreases with increase of depth]

SITE.	Serial No	Date	Gauge-Reading. H	Mean Velocity V	RANGE of Mean Vely Actual.	RANGE of Mean Vely Percent (of max.)
SOLANI LEFT AQUEDUCT.	102	2 4-'75	9 75	3 49	02	6
		" "	·75	3 47		
		31-3- "	9 70	3 64	·10	2 8
		" "	70	3 54		
		1-4- "	9·70	3 49	04	1 1
		" "	·70	3 53		
		30-3- "	9 65	3 60	03	8
		" "	65	3 63		
		29-3- "	9 50	3 71	·02	5
		" "	50	3 73		
		3 4- "	9·50	3 41	05	1·4
		" "	50	3 52		
	104	23-3- "	9 15	3 55	14	3 8
		" "	15	3 69		
		24-3- "	9 15	3 61	·00	·00
		" "	·15	3 61		
		22 3- "	9 10	3 63	·05	1 4
		" "	10	3 68		
		25-3- "	9 10	3 67	07	1 9
		" "	·10	3·60		
		20-3- "	8 90	3 65	·02	6
		" "	90	3 61		
		" "	·90	3 59		

SITE	Serial No	Date.	Gauge-Reading H	Mean Velocity V	RANGE of Mean Vely Actual.	RANGE of Mean Vely Percent (of max.)
SOLANI RIGHT AQUEDUCT.	111	14 7-'76	8 90	4 02	05	1 2
		" "	90	3 97		
		16-4 '77	8 64	3 66	00	·0
		" "	64	3 66		
		17-4- "	8 60	3·69	·07	1 9
		" "	·60	3 72		
		" "	59	3 66		
		" "	·59	3 73		
	112	11 4- "	8 58	3 76	+ 11	2 9
		" "	·57	3 66		
		" "	56	3 75		
		" "	·55	3 65		
		13 7 '76	8 50	3 75	12	3 1
		" "	50	3·82		
		1 4- "	8 05	3 51	00	0
		" "	·05	3 31		
		4 4- "	8·00	3 60	·08	2 2
		" "	00	3 63		
		" "	·00	3 55		
	114	6 4- "	7 98	3 51	− 13	3 6
		" "	98	3 50		
		" "	95	3 63		
		5 4- "	7 95	3 38	07	1 9
		" "	95	3 38		
		" "	95	3 37		
		" "	·90	3 64		

SITE.	Serial No.	Date	Gauge Reading H or h	Mean Velocity V	RANGE of Mean Vely Actual	RANGE of Mean Vely Percent (of max.)
R. AQUEDUCT, (L. Aq closed)	131	27-10-'77	4 60	1 21	05	4 0
		" "	60	1 26		
	132	1 9-'76	3 98	4 87	+ 09	1·9
		" "	93	4 78		
	130	20-9-'78	2 71	2 28	+ ·17	7 5
		" "	60	2 11		
	135 136	21 9- "	3 18	3 20	+ 41	12 8
		" "	·12	2 79		
	134 137 138	31 8-'76	3 58	3 22	+ 71	22 0
		" "	·13	2 51		
		" "	2 88	2 54		
SOLANI EMBANKMENT MAIN SITE.	151	19 12-'78	9 93	3·93	− ·11	2 7
		" "	91	4·04		
		22 12-'76	9·98	3 93	05	1 3
		" "	98	3 88		
	152	28-12- "	9 89	3 88	− ·08	2 1
		" "	91	3 80		
		26 12- "	9 85	3 74	·12	3 1
		" "	85	3 86		
		29-1-'77	8 44	3 32	− 06	1 8
		" "	47	3 26		
	156	30 1- "	8 41	3 23	− ·08	2 5
		" "	42	3 15		
	160	22 2 '78	7·07	3 19	+ 04	1 2
		" "	07	3 18		
		" "	·10	3 22		

SITE	Serial No	Date.	Gauge Reading h	Mean Velocity V	RANGE of Mean Vely Actual.	RANGE of Mean Vely Per cent. (of max.)
SOLANI EMBANKMENT MAIN SITE.	169	17-2 '77	3 79	1 87	+ 09	4 8
		" "	78	1 78		
		6 10-'76	3 76	1 91	+ 06	3 1
		" "	75	1 89		
		" "	73	1 85		
		" "	72	1·87		
		5-10- "	3·72	1 86	+ 01	5
		" "	71	1 85		
		" "	70	1 85		
	171	30 10 '77	3·61	·81	− 03	3 6
		" "	57	84		
	175	4-10-'76	2 87	1 82	− ·07	3·9
		" "	90	1 79		
		" "	92	1 80		
		" "	91	1 75		
		" "	90	1 78		
	178	16-10-'77	2 30	86	− 10	11 6
		" "	55	76		
	179	2 10-'76	2 00	1 34	+ ·03	2 2
		" "	1 99	1·31		
		3-10- "	1 85	1 21	− ·01	8
		" "	84	1 22		
BELRA.	202	23 1-'79	6 98	3 19	+ 06	1 9
		" "	·94	3 13		
	203	25 2- "	6 73	3·06	+ 05	1 6
		" "	·75	3 01		
	204	27 2- "	6·51	2 96	− 03	1 0
		" "	·49	2 99		

SOLANI RIGHT AQUEDUCT	108	1-6-'77 „ „	10·00 ·00	3·96 3·87	·09	2·3
		7-6- „ „ „	9·97 97	3·94 3·96	02	5
		8-6- „ „ „	9·96 97	3·88 3·85	− 03	8
		17-5-'76 „ „	9·87 85	3·95 4·00	− 05	1·3
	109	8-5-'77 „ „	9·65 65	3·78 3·74	04	1·1
		14-11- „ „ „	9·64 66	4·28 4·17	+ 11	2·6
		19-11- „ „ „	9·63 63	4·12 4·13	·01	·2
		15-5-'76 „ „	9·63 ·63	3·86 3·87	01	3
		11-5- „ „ „	9·63 ·58	3·86 3·88	− ·02	5
	110	27-4-'77 „ „	9·41 ·42	3·70 3·73	+ 03	·8
		1-5-'76 „ „	9·33 30	3·90 3·87	+ 03	8
		2-5- „ „ „	9·30 ·30	3·79 3·91	·12	3·1
		3-5- „ „ „	9·30 ·30	3·80 3·82	02	5
		20-4- „ „ „ „ „ „ „	9·25 ·25 ·25 ·25	3·75 3·76 3·80 3·75	05	1·3
	111	20-4 '78 „ „	9·01 ·02	3·85 3·78	− 07	1·8
		24-5-'76 „ „	8·95 95	3·81 3·80	02	5
		25-4-'77 „ „	8·94 ·94	3·73 3·70	03	8

SOLANI RIGHT AQUEDUCT	114	26-6-'76 „ „	7·95 89	3·76 3·71	+ 05	1·3
	118	14-1-'78 „ „ „ „	6·68 69 69	3·53 3·55 3·55	+ 02	·6
		16 1- „ „ „ „ „	6·68 68 68	3·60 3·54 3·56	·06	1·7
		12 1- „ „ „	6·67 ·67	3·61 3·63	02	6
		11-12-'77 „ „ „ „	6·65 ·65 65	3·49 3·67 3·59	·08	2·2
		17-1-'78 „ „ „ „	6·63 ·63 63	3·57 3·58 3·59	02	6
	120	13-10 '77 „ „ „ „ „ „	5·93 86 85 84	3·13 3·12 3·18 3·19	− 07	2·2
		12 10- „ „ „ „ „ „ „	5·77 ·76 ·63 ·63	3·27 3·13 3·27 3·24	± 09	2·8
	122	22 12- „ „ „ „ „ „ „ „ „ „ „	4·57 57 57 57 57 57	2·77 2·81 2·88 2·83 2·84 2·84	·11	3·8
		24 12- „ „ „ „ „	4·43 45 42	2·69 2·72 2·74	− 05	1·8
		23 8 '78 „ „	4·43 35	3·24 ·35	− 11	3·3
	126 127	11 7- „ „ „	1·93 ·70	1·24 60	+ 64	51·6

SOLANI EMBANKMENT MAIN SITE	161	19 2-'76 „ „	6·84 84	3·14 3·18	04	1·3
		23 1- „ „ „	6·83 84	3·11 3·10	− 01	·3
		24 1- „ „ „	6·84 83	3·16 3·14	+ 02	0
		22 1- „ „ „	6·82 82	3·08 3·08	00	0
	163	24 10-'76 „ „	6·28 ·26	3·41 3·52	− ·11	3·1
	163	21-10- „ „ „	5·66 62	3·15 3·12	+ 03	1·0
		19 10 „ „ „	5·53 56	3·06 2·99	− 07	2·3
		20-10- „ „ „	5·55 ·51	3·04 2·95	+ ·09	3·0
	164 166	11-10 '77 „ „	5·24 4·26	2·73 2·33	+ 40	14·7
	165	10 10 '76 „ „ „ „	4·97 5·00 ·00	2·62 2·60 2·46	− 16	6·1
		11-10- „ „ „	4·90 86	2·42 2·38	+ 04	1·7
	165 166	10 10-'77 „ „	5·01 4·53	2·87 2·39	+ ·48	16·7
	167	7 10-'76 „ „	4·08 ·07	2·06 2·06	00	·0
		10 2 '77 „ „	4·00 ·00	2·17 2·16	01	5
		14-2- „ „ „	3·98 98	2·20 2·19	01	5
		19 2- „ „ „ „ „	3·99 96 92	2·15 2·14 2·10	+ 05	2·3
	168 170	15 10 „ „ „	3·98 3·64	1·69 1·46	+ ·23	13·6

JAOLI	211	7-1-'79 „ „	7·28 28	2·93 2·97	04	1·4
	212 213	25-2- „ „ „	6·60 57	2·82 2·87	− 05	1·7
	214	27 2- „ „ „	6·23 23	2·81 2·79	02	7
	215 216	15-1- „ „ „	5·96 ·74	2·95 2·84	+ ·11	3·7
KAMHERA	222	4-1-'79 „ „	6·03 ·02	2·82 2·83	− 01	4
		15-1- „ „ „	6·00 01	2·77 2·79	+ 02	7
		17-1- „ „ „	6·01 ·00	2·85 2·85	00	·0
	223	14-1- „ „ „	5·93 ·92	2·95 2·86	+ 09	3·1
		27 2- „ „ „	5·73 ·72	2·79 2·78	+ 01	·4
	224	23 2- „ „ „	5·45 ·45	2·70 2·69	·01	4
DISTRIBUTARIES.	231	29 3 '79 „ „	4·35 34	2·51 2·52	− 01	·4
	232	28 3- „ „ „	8·10 ·09	2·10 2·10	·00	0
	233	13 3- „ „ „	4·08 ·05	2·14 2·14	00	0
		18-3- „ „ „	8·90 85	2·10 2·03	+ 07	3·3
	236	21 3- „ „ „	2·83 ·83	1·49 1·49	·00	0
	237	19-3- „ „ „	3·79 ·78	1·82 1·84	− ·02	1·1
	238	20-3 „ „ „	3·37 28	1·79 1·71	+ ·08	4·5

CUBIC DISCHARGE-VERIFICATION

ABSTRACT TABLE 27.

DISCHARGE MEASUREMENTS AT SAME SITE ON SAME DAY.

Details of Cases of very high (over 10 %), high (over 5 %), and moderate (over 3 %), Discrepancy

[The + and − signs in the Discrepancy Column indicate that the Mean Velocity increases or decreases with the depth]

			1	8				2		3			4				5		
				MEAN VELOCITY				DEPTH		SURFACE FALL			WIND					PROBABLE CAUSES	
						Discrepancy							From		To				
DISCREPANCY	SITES	Serial No	Date, 1875 79	High V.	Low V.	Actual.	Per cent (of mean)	Gauge Hork	Variation.	Middle F_2	Lower F_3	Slope S	Direction	Velocity	Direction.	Velocity	Timekeeper	of high velocity	of uncertain results.
High and very high (over 5, & 10 %)	SOLANI RIGHT AQUEDUCT Left Aqueduct open	126	11·7·'78	1 24	..	+ 64	51 6	1 97	− 24	No Middle Sub Reach	?−38	?	S	6	S	5	R	.. .. ?	Water fell 1 36
		127	" "	..	·60			0 70	00		?00	113	S	11	S	8	P	.. ..	
	SOLANI RIGHT AQUEDUCT Left Aqueduct closed	136	21 9 '76	..	2 79	+ 41	12 8	3 12	+ 03		62	208	..	0	..	0	R	.. ..	Water rose ·10
		135	" "	3 20	..			3 18	+ 05		68	253	..	0	..	0	P	High F_3, and S ..	
		136	81 8-'76	..	2 64	+ 08	21 1	2 88	+ 05		18	145	..	0	..	0	W	.. ..	Water rose ·76
		137	" "	..	2 51	+ 71	22 0	3 13	+ 10		·43	200	.	0	SW	12	H	.. ..	
		134	" "	3 22	..	..	..	3 58	+ 06		83	?	SSW	10	SW	9	W	High F_3	
		139	20 9-'76	2 28	..	+ 17	7 5	2 71	− 02		21	168	NW	1	V	1	R	High F_3, and S ..	Water fell ·12.
			" "	..	2 11			2 60	·00		10	133	V	1	S	5	P	.. ..	
	SOLANI EMBANKMENT	166	11 10-'77	..	2 33	+ 40	14 7	4 26	00	1 23	2 00	?	E	4	E	10	G	.. ..	Water rose 1 35
		164	" "	2 73	..	..	..	5 24	+ 75	1 72	2 40	?	W	7	N	4	P	High F_1, F_2, and F_3	
		165	10-10-'76	2 62	..	− 16	6 1	4 97	+ 02	94	1 30	180	..	0	NW	6	W	High F_1	Water rose ·05.
			" "	2 60	..	·14	5 4	5 00	+ 03	97	"	170	NW	6	..	0	P	High F_1	
			" "	..	2 46	..	·	5·00	00	"	"	170	..	0	W	5	W	.. ..	
		165	10 10-'77	2 87	..	..	..	5 01	− 05	1 26	2 32	?	E b S	5	SW	7	G	High F_2	Water fell ·54
		166	" "	..	2 39	+ 48	16 7	4 53	− 07	1 20	1 90	?	WSW	9	WSW	0	G	.. ..	
		166	15 10-'77	1 69	..	..	..	3 98	− 23	65	60	?	ENE	9	E	17	G	High F_1, F_2, and F_3	Water fell ·48.
		170	" "	..	1 46	+ 23	13 6	3 64	− 06	·56	35	?	SE b S	5	V	1	G	.. ..	
		178	16 10-'77	86	..	− 10	11 6	2 30	00	27	·10	?	..	0	SE	8	G	High F_1	Water rose 30
			" "	..	·76			2 55	+ 10	37	·25	?	S b W	7	..	0	P	.. ..	

Cases of moderate (over 3 per cent) Discrepancy

SOLANI AQUEDUCTS.	Left	104	23-3-'75	..	3 55	·14	3 8	9 15	00	8$_2$	5 6$_0$	No Middle SubReach.	5 15	?	..	0	?	70	B	..	..		..	..	
			,, ,,	3 69	..			9 15	·00	8$_1$	,		,,	?	?	70	..	0	W	..	..	?	..	..	
	Right (Left open)	110	2 5-'76	..	3 79	·12	3 1	9 30	·00	9	5 85		5 23	19$_5$	..	0	..	0	W	..	..		..	..	
			,, ,,	3 9^1	..			9 30	00	9	,,		,,		..	0	..	0	H	..	..	?	..	..	
		112	13-7 ,,	..	3 75	12	3 1	8 50	00	8	5 90		4 60	220	..	0	NNE	8	H	..	..		..	..	
			,, ,,	3 8$_1$	..			8 50	00	8	,,		,,	,,	NNE	8	NE	5	W	..	..	?	..	..	
		114	6-4· ,,	3 6$_3$	..	..	..	7 93	00	7	5 85		4 25	?	..	0	..	0	H	..	..	?	..	..	Water unsteady.
			,, ,,	..	3 5^1	− 12	3 3	7 98	+ ·05	7	5 82		4 28	?	..	0	SW	5	W	..	..		..	..	
			,, ,,	..	3 5^0	− 13	3 6	7 98	− 05	7	,,		,,	?	SW	5	SW	9	H	..	..		..	..	
		122	22-12-'77	..	2 77	·11	3 8	4 57	00	4	5 63		1 77	?	E	8	V	6	F	..	..		..	..	
			,, ,,	2 88	..			4 57	00	4	,,		,,	?	S	9	S	9	F	..	..	?	..	..	
		122	23-8-'78	3 35	..	− 11	3 3	4 33	+ 05	3$_1$	6·05		1 9$_5$	260	..	0	N	6	B	Short Rod, High S					Water rose ·13.
			,, ,,	..	3 24			4 43	+ 05	4	6 37		2 23	243	N	7	E	8	F	..	..		..	..	
	Right (Left closed)	131	27 10-'77	..	1 2^1	·05	4 0	4 60	00	4	3 60		·10	021	..	0	SW	6	G	..	..		..	..	
			,, ,,	1·26	..			4 60	00	4	,,		,,	026	SW	6	NE	5	P	..	..	?	..	..	
SOLANI EMBANKMENT MAIN SITE.		152	20 12-'76	..	3 74	·12	3 1	9 83	+ 01	Longest possible.	4 78	1.18	5 96	?	SE	4	E	13	P	..	..		..	..	High wind.
			,, ,,	3 86	..			9 83	·00		,,	1 17	5 93	?	E	9	SE	5	W	..	..	?	..	..	.. ..
		162	24 10- ,,	..	3 4^1	−·11	3·1	6 28	− 01		5 25	1 10	3 15	170	..	0	ENE	7	P	..	..		..	..	
			,, ,,	3 5$_2$	..			6 26	− 02		5 27	,,	3 13	160	ENE	7	NE	4	W	..	..	?	..	..	
		169	17-2-'77	1 8$_7$	..	+·09	4 8	3 79	− 03		4 39	·96	90	?	SW	6	S	6	P	..	..	?	..	..	.. ..
			,, ,,	..	1 78			3 78	00		4 40	·05	89	?	E	6	SW	19	W	..	..		..	..	High wind.
		169	6 10-'76	1 91	..	+ 06	3 1	3 76	00		4 67	93	1·00	200	..	0	..	0	P	..	..	?	..	..	
			,, ,,	..	1 8$_5$			3 73	− 01		4 70	90	,,	,,	NNE	7	NE	6	P	..	..		..	..	
		171	30-10-'77	84	..	−·03	3 6	3·57	00		3 66	24	00	?	E	10	S	9	G	..	..	?	..	..	High wind.
			,, ,,	..	8$_1$			3·61	+ 08		3 52	·24	01	?	S	9	SW	18	P	..	..		..	..	Water rose ·08.
		175	4 10-'76	1 8$_2$	..	− 07	3 9	2 87	+·05		5 06	1 14	1 40	215	..	0	..	0	H	..	..	?	..	..	Water rose ·06.
			,, ,,	..	1 75			2 91	− 01		5·02	1 18	,,	,,	..	0	..	0	W	..	..		..	..	
JAOLI.		215	15-1-'79	..	2 8$_4$	+·11	3 7	5 74	+ 06	,,	·40	..	4 39	166	N	8	..	0	S	..	..		..	..	Water rose ·23.
		216	,, ,,	2 95	..			5 96	+·08	,,	18	..	4 61	,,	S	7	V	1	B	..	..	?	..	..	
KAN HERA		223	14-1-'79	2 95	..	+·09	3 1	5 93	− 01	,,	3 00	..	11 49	29$_5$	N	13	N	13	cl	..	..	?	..	..	High wind.
			,, ,,	..	2 86			5 92	·00	,,	2 99	..	11·48	..	NW	10	NW	6	C	..	..		..	..	.. ..
DISTRIBUTARIES.		233	18 3-'79	..	2 03	+ 07	3 3	3 83	00	Longest possible	?	?	?	?	..	0	..	0	B	..	..		..	..	Water rose ·08
			,, ,,	2 10	..			3 90	+·06		?	?	?	?	..	0	..	0	C	..	..	?	..	..	
		238	20-3- ,,	1 79	..	+ 08	4 5	3 37	− 02		?	?	?	?	..	0	W	1	B	..	..	?	..	..	Water fell ·13.
			,, ,,	..	1·71			3·28	− 00			?	?	?	W	1	W	1	C	..	..		..	..	

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 30.

Simultaneous Discharge-Measurements at successive Sites of same Reach.

	1			2			3				4				5	7		9			
				Depth.			Surface Fall				Wind					Cubic Discharge		Discrepancy			
									Local Slope		From		To					Gain + Loss −			
	SITE [see last column]	Serial No.	Date, 1878 79	Above Datum [at Site]	Variation	At Solani Aqueduct Gauge.	Upper 5 miles	Lower 4½ miles.	Left Bank	Right Bank.	Direction.	Velocity.	Direction.	Velocity	Timekeeper's Initial	Partial [at lower Sites]	Total	Actual.	Per cent [of larger]	Probable cause of Discrepancy.	Reference to Sites.
				A			F_1+F_2	F_2	S	S						D	D				
17	Embkt	151	14-12-78	10 04	− 05	10 03	5 92	5 60	230	?	E	7	..	0	A	..	7,364				Upper Site, Solani Embankment Main Site; Lower Site, Solani Twin Aqueducts
	L Aq	101	„ „	10·00	−·03	10 00	5 95	5 57	183	..	NE	4	S	9	Cl	3,429	7,080	−284	3 9	? ?	
	R Aq	108	„ „	9 98	00	9 98	5 97	5 55	..	175	S	0	?	?	Cl	3,651					
18	Embkt	151	19-12- „	9 91	+ 04	9 80	6 00	5 40	228	225	E	4	E b S	8	A	..	7,197			High $(F_1 + F_2)$.	
	L. Aq	101	„ „	9 87	− 03	87	5 93	5 47	190	..	SE	1	NE	5	C	3,409	6,853	−344	4 8	High F_2.	
	R. Aq	108	„ „	9 87	·00	87	„	„	..	200	NE	5	NE	1	C	3,444				„ „	
19	Embkt.	151	20 12- „	9·88	−·01	9 80	5 90	5 40	228	238	S	3	W	10	A	..	6,940				
	L Aq	101	„ „	9 83	− 01	83	5 87	5 43	195	..	..	0	W	3	Cl	3,441	6,960	+ 20	·3	? ?	
	R Aq	108	„ „	9 82	+ 02	·82	5 88	5 42	..	205	W	4	SW	12	Cl	3,519					
20	Embkt.	153	15-4-'79	9 43	+·15	9 36	5 82	5 23	265	218	W	9	W	25	P	..	6,185			Water rose ·15,	
	L. Aq	103	„ „	9 37	+ 03	37	5 83	5 22	215	..	NW	1	SW	12	B	3,034	6,081	−104	1 7	and high wind.	
	R Aq	110	„ „	9 42	+·05	.42	5 78	5 27	..	200	W	1	SW	12	B	3,047					
21	Fmbkt	153	12 4.'75	9 47	00	9 43	5 97	4·75	205	226	E	8	E	8	G	..	6,162			.. ..	
	L. Aq	103	„ „	9 41	+·12	·41	5 99	4 71	198	..	SE b S	7	NE	5	R	3,107	6,297	+135	2 1	Water rose ·12.	
	R. Aq	109	„ „	9 51	00	51	5 89	4 81	..	190	W	12	E	23	R	3,190				High wind.	
22	Fmbkt	153	28 5- „	9 50	− 01	9 44	5 96	5 14	243	235	W	7	W	9	G	..	6,187				
	L Aq	103	„ „	9 48	·00	·48	5 92	5 18	205	..	W	6	NW	7	R	3,107	6,330	+143	2 3	? ?	
	R. Aq	110	„ „	9 42	00	·42	5 98	5 12	..	186	NW	1	W	1	R	3,223					
23	Embkt.	153	27-5- „	9 45	−·01	9 38	5 92	5 08	220	233	W	1	W	9	P	..	6,231				
	L Aq	103	„ „	9 40	·00	·40	5·90	5·10	210	..	SW b W	6	SW	8	T	3,126	6,246	+ 17	·3	? ?	
	R Aq	110	„ „	9 38	00	38	5 92	5 08	..	190	S	8	SW	18	T	3,122					
24	Embkt.	153	6 4- „	8 75	·00	8 67	5 93	4 74	215	233	W	6	W	6	G	..	5,379				
	L. Aq	105	„ „	8 67	00	67	5 93	4 74	225	..	NW	2	W	5	T	2,781	5,673	+294	5·2	? ?	
	R. Aq	112	„ „	8 67	·00	67	„	„	..	193	W	3	NW	3	T	2,892					

Cases of moderate (over 3 per cent) Discrepancy

SOLANI AQUEDUCTS.	Left.	104	23 3 '75	..	3 55	·14	3 8	9 15	00	8½	5 65	No Middle SubReach.	5 15	?	..	0	?	70	R	..	..		..	..	
			,, ,,	3 69	..			9 15	00	8¼	.		,,	?	?	70	..	0	W	..	..	?	..	..	
	Right (Left open)	110	2 5-'76	..	3 79	12	3 1	9 30	00	9	5 85		5 25	19.	..	0	..	0	W	..	..		..	..	
			,, ,,	3 91				9 30	00	9	,,		..		..	0	..	0	H	..	..	?	..	..	
		112	13 7- ,,	..	3 75	12	3 1	8 50	00	8	5 90		4 00	220	..	0	NNE	8	H	..	..		..	..	
			,, ,,	3 82	..			8 50	00	8	..		,,	,,	NNE	8	NE	5	W	..	..	?	..	..	
		114	6-4- ,,	3 63	..	..	..	7 93	00	7	5 83		4 25	?	..	0	..	0	H	..	..	?	..	..	Water unsteady
			,, ,,	..	3 51	− 12	3 3	7 98	+ ·05	7	5 82		4 28	?	..	0	SW	5	W	..	..		..	..	
			,, ,,	..	3 50	− 13	3 6	7 98	− 05	7	,,		,,	?	SW	5	SW	9	H	..	..		..	..	
		122	22-12 '77	..	2 77	·11	3 8	4 57	00	4	5 63		1 77	?	E	8	V	5	P	..	..		..	..	
			,, ,,	2 88	..			4 57	00	4	,,		,,	?	S	9	S	9	P	..	..	?	..	..	
		122	23 8-'78	3 35	..	− 11	3 3	4 35	+ 05	3½	6 05		1 93	260	..	0	N	5	R	Short Rod, High S					Water rose ·13.
			,, ,,	..	3 44			4·43	+ 05	4	6 37		2 23	243	N	7	E	8	F	..	..		..	..	
	Right (Locked)	131	27-10-'77	..	1 21	·05	4 0	4 60	00	4	3 60		·10	024	..	0	SW	6	G	..	..		..	..	
			,, ,,	1 26	..			4 60	00	4	,,		,,	026	SW	6	NE	5	P	..	..	?	..	..	
SOLANI EMBANKMENT MAIN SITE.		152	26-12-'76	..	3 74	·12	3 1	9 85	+ ·01	Longest possible.	4 78	1·18	6·96	?	SE	4	E	13	P	..	..		..	..	High wind.
			,, ,,	3 86	..			9 85	00		,,	1 17	6 93	?	E	9	SE	5	W	..	..	?	..	..	.. ..
		162	24-10- ,,	..	3 41	−·11	3 1	6 28	− ·01		5 25	1 10	3 15	170	..	0	ENE	7	P	..	..		..	..	
			,, ,,	3 52	..			6 26	− 02		5 27	,,	3 13	160	ENE	7	NE	4	W	..	..	?	..	..	
		169	17 2-'77	1 87	..	+ ·09	4 8	3 79	− 03		4 39	96	90	?	SW	6	S	6	P	..	..	?	..	..	.. ..
			,, ,,	..	1 78			3 78	00		4 40	·05	89	?	S	6	SW	19	W	..	..		..	..	High wind.
		169	6·10·'76	1 91	..	+ 06	3 1	3 76	00		4 67	93	1 00	200	..	0	..	0	P	..	..	?	..	..	
			,, ,,	..	1 85			3 73	− 01		4 70	90	,,	,,	NNE	7	NE	5	P	..	..		..	..	
		171	30-10-'77	·84	..	− ·03	3 6	3·57	00		3 66	·24	·00	?	E	10	S	9	G	..	..	?	..	..	High wind.
			,, ,,	..	·81			3 61	+ 03		3 62	24	04	?	S	9	SW	16	F	..	..		..	..	Water rose ·08.
		175	4·10-'76	1 82	..	− 07	3 0	2 87	+ ·05		5 06	1 14	1 40	215	..	0	..	0	H	..	..	?	..	..	Water rose ·06.
			,, ,,	..	1 75			2 91	− 01		5 02	1 18	,,	,,	..	0	..	0	W	..	..		..	..	
JAOLI.		215	15·1·'79	..	2 84	+ ·11	3 7	5 74	+ 06	,,	40	..	4 39	160	N	3	..	0	S	..	..		..	..	Water rose ·20.
		216	,, ,,	2 95	..			5 90	+ 03	,,	18	..	4 61	,,	S	7	V	5	R	..	..	?	..	..	
RAN BERA		223	14·1·'79	2 95	..	+ ·09	3 1	5 93	− 01	,,	3 00	..	11 49	29.	N	13	N	13	Cl	..	..	?	..	..	High wind.
			,, ,,	..	2·86			5·92	·00	,,	2·99	..	11·48	,,	NW	10	NW	6	C	..	..		..	..	.. ..
		233	18-3-'79	..	2·03	+ ·07	3 3	3 83	·00	possible	?	?	?	?	..	0	..	0	R	..	..		..	..	Water rose ·08.
			,, ,,	2 10	..			3 90	+ ·06		?	?	?	?	..	0	..	0	C	..	..	?	..	..	
		238	20-3- ,,	·79	..			3·37	− ·02		?	?	?	?	..	0	W		R	..	..	?	..	..	

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 28.

DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH, NON-SIMULTANEOUS.

SOLÁNÍ EMBANKMENT MAIN SITE, AND SOLÁNÍ TWIN AQUEDUCT SITES.

	1			2			3		4				5	7			8	9		
				DEPTH			SURFACE FALL		WIND.					CUBIC DISCHARGE.				DISCREPANCY in Discharge.		
									From		To							Gain + Loss −		
COMPARISON NO.	SITE.	Serial No.	Date, 1871.	Above Datum (at Site) h or H	Variation	At Solani Aqueduct Gauge	Upper 5 miles. F_1+F_2	Lower 4½ miles F_3	Direction	Velocity.	Direction.	Velocity	Timekeeper's Initial.	At Lower Sites D	Correction for change of depth	Total D	Mean Velocity V	Actual.	Per cent. of max	Probable cause of Discrepancy.
1	Embkt.	157	3-3	8·13	·00	8·03	5·90	4·35	S	4	..	0	W	..	..	4,750	3·26			High F_3.
	L. Aq	106	23-2	7·97	·00	7·97	5·98	4·17	S	13	S	17	W	2,399	+24	4,934	3·54	+184	3·7	High (F_1 + F_2).
	R. Aq	114	„	7·97	·00	·97	„	„	S	8	S	13	W	2,486	+25		3·67			High wind.
2	Embkt	157	5-3	8·10	·00	8·00	5·00	4·30	N	4	N	4	P	..	..	4,893	3·37			
	L Aq	106	„	8·00	·00	·00	„	„	S	6	V	*l*	P	2,368	0	4,782	3·48	−111	2·3	? ?
	R. Aq	114	„	8·00	·00	·00	„	„	V	*l*	S	6	P	2,414	0		3·55			
3	Embkt.	157	6-3	8·08	+·01	7·97	5·93	4·27	NW	10	..	0	W	..	..	4,594	3·18			
	L. Aq	106	„	7·98	·00	·98	5·92	4·28	..	0	..	0	W	2,328	−3	4,806	3·43	+212	4·4	? ?
	R Aq	114	„	7·98	·00	·98	„	„	N b E	7	..	0	W	2,484	−3		3·66			
4	Embkt.	157	7-3	8·07	·00	7·97	5·93	4·27	NW	4	SW	4	P	..	..	4,835	3·35			.. ..
	L Aq	106	23-3	7·97	·00	·97	5·83	4·27	V	*l*	V	*l*	P	2,227	0	4,709	3·34	−126	2·6	Low F_1.
	R. Aq	114	7-3	7·98	·00	·98	5·92	4·28	V	*l*	S	17	P	2,485	−3		3·66			High wind.
5	Embkt.	159	2-3	7·60	·00	7·55	5·85	4·00	W	9	W	14	W	..	..	4,467	3·26			High wind.
	L. Aq	107	15-3	7·43	·00	·43	5·87	3·93	S	4	N	7	W	2,151	+35	4,309	3·41	−158	3·5	Low F_3
	R. Aq	116	27-3	7·56	+·02	·56	5·84	4·01	N	5	NW	4	W	2,126	−3		3·49			.. ..
6	Embkt.	159	27-2	7·46	·00	7·40	5·80	3·90	S b W	7	W b S	25	P	..	..	4,108	3·05			High wind.
	L. Aq	107	21-2	7·48	·00	·48	6·02	3·98	V	*9*	V	*g*	P	2,131	−23	4,418	3·35	+310	7·0	High (F_1 + F_2).
	R. Aq	116	„	7·45	+·06	·45	6·05	3·95	V	*g*	V	*g*	P	2,323	−15		3·57			

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 29.

SIMULTANEOUS DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH.

FIFTEENTH MILE SITE, AND SOLÁNI EMBANKMENT MAIN SITE

	1			2				3				4				5	7	9		
				DEPTH				SURFACE FALL				WIND.						DISCREPANCY		
										Local Slope		From		To				Gain + Loss −		
COMPARISON NO	SITE.	Serial No.	Date, 1878-79	Above Datum [at Site.] A	Variation	At Soláni Aqueduct Gauge	Date of Soundings	Upper 5 miles. F_1+F	Lower 4½ miles. F_2	Left Bank. s	Right Bank. s	Direction.	Velocity	Direction	Velocity	Timekeeper's Initial.	CUBIC DISCHARGE. D	Actual.	Per cent. [of larger]	Probable cause of Discrepancy.
7	15th M	190	18 12 '78	15 20	− 03	9 83	16-12-'78	5 97	5·43	215	?	W	3	..	0	R	6,921	+423	5 8	? ?
	Lmbkt.	151	„ „	9 95	− 01	88	„ „	5 92	5 48	225	228	S	5	E	7	P	7,344			
8	15th M	196	19 12- „	15 17	+ 01	9 85	16-12- „	5·85	5·45	213	238	..	0	V	1	S	6,844	+353	4 9	High $(F_1 + F_2)$.
	Embkt.	151	„ „	9 91	+ 04	80	„ „	6 00	5 40	226	225	E	4	E b S	8	A	7,107			
9	15th M	196	20-12 „	15 10	00	9 80	16 12 „	5 90	5 23	210	233	..	0	V	1	R	6,806	+134	1 9	High F_2.
	Embkt	151	„ „	9 88	− 01	80	„ „	5 90	5 49	228	236	S	3	W	10	A	6,940			
10	15th M	197	15-4-'79	14 60	+·10	9 33	28 4 '79	5 86	5 20	215	225	V	1	SW	14	S	6 287	−102	1 6	High wind.
	Embkt	153	„ „	9·43	+·15	·38	16 12 '78	5 82	5 23	265	218	W	9	W	25	P	6,165			
11	15th M	191	29 5-'78	15 31	+ 02	9 90	28 3-'78	5 91	5 54	240	Not observed.	NW	1	NE	8	R	7,187	−597	8 3	? ?
	Lmbkt	152	„ „	10·03	−·07	98	15-8 '76	5 92	5 53	213		W	8	..	0	G	6,690			
12	15th M	192	10-4 „	14 33	− 01	9 00	28-3-'78	5 90	4 90	253		..	0	..	0	T	6,226	−357	5 7	? ?
	Embkt.	154	„ „	9 11	+ 02	00	15-8-'76	5 90	4 90	215		V	1	..	0	G	5,869			
13	15th M	193	8-4 „	14 03	+ 12	8 70	26 3 '78	5 90	4 75	228		..	0	..	0	R	5,851	−391	5 7	? ?
	Embkt	155	„ „	8 82	+ 05	70	15 5 '76	5 90	4 75	215		V	1	W	6	P	5,460			
14	15th M	193	4-4- „	13 98	00	8 70	28 3 '78	5 90	4 75	223		..	0	..	0	R	5,771	−154	2 7	? ?
	Embkt.	155	„ „	8 80	+ 01	70	15-5 '76	5 90	4 75	217		W	6	..	0	P	5,617			
15	15th M	193	29 3- „	13 95	00	8 70	28 3 '78	5 90	4 70	230		N	8	NW	7	R	5,737	−372	6 5	High wind.
	Embkt.	155	„ „	8 73	− 02	·70	15 8-'76	5 90	4 70	205		W	20	W	19	P	5,365			
16	15th M.	195	25 5- „	12 53	+·15	7·03	28-3-'78	5 85	3 65	?		..	0	N	1	T	4,370	−208	4 8	? ?
	Embkt.	160	„ „	7 20	+ 09	·03	15 8 '76	5 85	3 63	218		..	0	V	1	G	4,162			

CUBIC DISCHARGE-VERIFICATION. ABSTRACT TABLE 30.

SIMULTANEOUS DISCHARGE-MEASUREMENTS AT SUCCESSIVE SITES OF SAME REACH

COMPARISON NO	1			2			3				4				5	7		9			
	SITE (see last column)	Serial No.	Date, 1878 79	DEPTH,			SURFACE-FALL				WIND.				Timekeeper's Initial.	CUBIC DISCHARGE		DISCREPANCY		Probable cause of Discrepancy.	Reference to Sites
				Above Datum (at Site)	Variation.	At Solani Aqueduct Gauge.	Upper 5 miles.	Lower 4½ miles.	Local Slope		From		To			Partial (at lower Sites)	Total.	Gain + Loss −			
				h			F_1+F_2	F_3	Left Bank	Right Bank	Direction.	Velocity	Direction.	Velocity				Actual.	Per cent (of larger).		
									S	S						D	D				
17	Embkt	151	14-12-'78	10·04	− ·05	10·03	5·92	5·60	230	?	E	7	..	0	A	..	7,364			? ?	Upper Site, Solani Embankment Main Site; Lower Site, Solani Twin Aqueducts
	L Aq	101	" "	10·00	−·03	10·00	5·93	5·57	183	..	NE	4	S	9	cl	3,429	7,080	−284	3·9		
	R. Aq	108	" "	9·98	·00	9·98	5·97	5·55	..	170	S	9	?	?	cl	3,651					
18	Embkt.	151	19-12- "	9·91	+ ·04	9·80	6·00	5·40	228	225	E	4	E&S	8	A	..	7,197			High (F_1+F_2)	
	L. Aq	101	" "	9·87	− ·03	·87	5·93	5·47	190	..	SE	1	NE	5	O	3,409	6,853	−344	4·8	High F_3	
	R. Aq	108	" "	9·87	·00	·87	"	"	..	200	NE	5	NE	1	O	3,444				" "	
19	Fmbkt.	151	20 12- "	9·88	− ·01	9·80	5·90	5·40	228	238	S	8	W	10	A	..	6,940			? ?	
	L. Aq	101	" "	9·83	− ·01	·83	5·87	5·43	195	..	..	0	W	3	cl	3,441	6,960	+ 20	·3		
	R Aq	108	" "	9·82	+ ·02	·82	5·88	5·42	..	205	W	4	SW	12	cl	3,519					
20	Embkt	153	15 4-'79	9·43	+·15	9·38	5·82	5·23	265	218	W	9	W	25	P	..	6,185			Water rose ·15, and high wind	
	L. Aq	103	" "	9·37	+ ·03	·37	5·83	5·22	215	..	NW	1	SW	12	B	3,034	6,081	−104	1·7		
	R Aq	110	" "	9·42	+·05	·42	5·78	5·27	..	200	V	1	SW	12	B	3,047					
21	Fmbkt.	153	12-4-'78	9·47	·00	9·43	5·97	4·75	205	228	E	8	E	6	G	..	6,162			.. ..	
	L. Aq	103	" "	9·41	+ ·12	·41	5·99	4·71	198	..	SE&S	7	NE	8	R	3,107	6,297	+135	2·1	Water rose ·12. High wind.	
	R. Aq	109	" "	9·61	·00	·51	5·89	4·81	..	190	V	12	E	23	R	3,190					
22	Embkt	153	28 5- "	9·50	− ·01	9·44	5·96	5·14	243	235	W	7	W	9	G	..	6,187			? ?	
	L Aq	103	" "	9·48	·00	·48	5·92	5·18	205	..	W	6	NW	7	R	3,107	6,330	+143	2·3		
	R. Aq	110	" "	9·42	·00	·42	5·98	5·12	..	188	NW	1	V	1	R	3,223					
23	Embkt.	153	27 5- "	9·45	− ·01	9·38	5·92	5·08	220	233	V	1	V	9	P	..	6,231		-	? ?	
	L Aq	103	" "	9·40	·00	·40	5·90	5·10	210	..	SW&W	8	SW	8	T	3,126	6,246	+ 17	·3		
	R. Aq	110	" "	9·38	·00	·38	5·92	5·08	..	190	S	8	SW	13	T	3,122					
24	Embkt.	153	6 4- ,	8·75	·00	8·67	5·93	4·74	215	233	W	6	W	6	G	..	5,379			? ?	
	L Aq	105	" "	8·67	·00	·67	5·93	4·74	223	..	NW	2	W	5	T	2,781	5,673	+294	5·2		
	R Aq	112	" "	8·67	·00	·67	"	"	..	193	W	3	NW	3	T	2,892					

25	Embkt.	155	20-3 78	8 53	− 21	8 48	5 92	4 48	199	230	SW	1	WSW	1	G	•	5,212				Upper Site Solani Embankment Main Site Lower Site Solani T via Aqueducts
	L. Aq	105	,, ,,	8 54	− 12	54	5 86	4·54	218		SW	1		0	R	2 629	5,300	+ 94	1·8	Water fell 25	
	R. Aq	112	,, ,,	8 41	− 12	41	5 99	4 41		198	WSW	5	WSW	1	R	2,677					
26	Embkt.	157	21 3 ,,	8 24	00	8 18	5·82	4 38	204	237	SE	3	V	1	G	•	5,070				
	L. Aq	106	,, ,,	8 19	00	19	5 81	4 39	2.0		SE	3	..	0	T	2 465	5,134	+ 64	1 3	? ?	
	R. Aq	113	, ,,	8 16	00	16	5 84	4 36		228	..	0	V	1	T	2,669					
27	Embkt.	157	12 3· ,,	8·05	00	7 99	5 86	4 19	200	227	SE	6	SE	8	P		4 820				
	L Aq	106	,, ,,	8 00	00	8 00	5 85	4 20	210		SE	6	SE	2	T	2 377	4,842	+ 16	3	? ?	
	R Aq	114	,, ,,	7 98	00	7 98	5 87	4·18		195	•	0	SE	8	T	2,465					
28	Embkt.	159	9·3· ,,	7 63	− 02	7 55	5 90	3 95	214	255	•	0	•	0	P		4,418				
	L. Aq	107	,, ,,	7 56	+ 02	·56	5 89	3 96	220		..	0	N	3	T	2 230	4 579	+ 161	3 5	? ?	
	R. Aq	116	,, ,,	7 55	00	55	5 90	3 95		203	V	1	..	0	T	2,319					
29	Embkt	179	8 3 ,,	7 61	− 01	7 53	5 92	3 93	211	241	W	10	V	1	P	..	4,436				
	L. Aq	107	, ,	7 53	− 01	53	5 92	3 93	223		SW	9	NW	4	R	2,228	4,524	+ 88	2 0	? ?	
	R. Aq	116	,, ,,	7 50	00	50	5 95	3 90		205	NW	6	NW	1	R	2,296					
30	Embkt.	159	11 3 ,,	7 60	− 01	7 51	5 91	3 91	218	233	..	0	•	0	G		4,452				
	L. Aq	107	,, ,,	7 51	00	51	5 94	3 91	235		•	0	..	0	R	2 211	4 516	+ 64	1 4	? ?	
	R. Aq	116	,, ,,	7 50	·00	50	5 95	3 90	..	205	..	0	..	0	R	2,305					
31	Embkt.	159	7 3	7 61	00	7 50	5 90	3 90	213	238	S b W	6	W	7	G		4,373				
	L. Aq	107	,, ,	7 50	·00	50	5 90	3 30	223	•	S	6	..	0	T	2 183	4,430	+ 66	1 5	? ?	
	R. Aq	116	,, ,	7 50	00	50	,,	,,		213	V	1	S	7	T	2 256					

Simultaneous Discharge-Measurements at three Sites

18 & 8	15th M	155	19 12 '78	15 17	+ 01	9 85	5 85	5 45	213	238	•	0	V	1	S	..	6 844				Upper, 15th Mile New Site Middle Solani Embankment Main Site Lower, Solani Twin Aqueducts
	Embkt	151	,, ,	9 91	+ 04	80	6 00	5 40	228	225	E	4	E b S	5	A	•	7,197	+ 353	4 9	Water unsteady	
	L. Aq	101	,, ,,	9 87	− 03	87	5 93	5 47	195	..	SE	1	NE	5	C	3 409	6,853	− 344	4 8	[see Aqueduct Gauge]	
	R. Aq	108	,, ,,	9 87	00	87	,,	,,	•	200	NE	5	NE	1	C	3 444					
10 & 9	15th M	196	20 12 ,,	15 10	00	9 80	5 90	5 23	210	233	..	0	V	1	R	..	6,806	+ 134	1 9		
	Embkt.	151	, ,,	9 88	− 01	80	5 90	5 50	228	238	S	3	W	10	A		6,940			? ?	
	L. Aq	101	,, ,,	9 83	− 01	8	5 87	5 43	195	..	..	0	W	3	cl	3 441	6,960	+ 20	·3		
	R. Aq	108	,, ,,	9 82	+ 02	82	5 88	5 42		205	W	4	SW	12	cl	3 519					
20 & 10	15th M	197	15 4 '79	14 60	+ 10	9 35	5 85	5 20	215	225	V	1	SW	14	S	..	6 287				
	Embkt.	153	,, ,,	9 43	+ 15	35	5 85	5 23	265	218	W	9	W	25	P	..	6,185	− 102	1 6	Water rose ·15,	
	L. Aq	103	,, ,	9 37	+ 03	37	5 83	5 22	215	•	NW	1	SW	12	B	3 034	6,081	− 104	1 7	and high wind	
	R. Aq	110	,, ,,	9 42	+ 03	42	5 78	5 27	..	200	V	1	SW	12	B	3,047					

ABSTRACT TABLE 31

CUBIC DISCHARGE-VERIFICATION

Discharge-Measurements in different Reaches—at same time, or in same water

Belra, Jaoli, and Kamhera Sites.

The Discharges in the four Distributaries are taken from the official Canal Tables (from the daily Gauge Readings). All other Results are actual Experiment, brought forward from Tables L.—LV

The Field-work of these Nos. 32—41 was done in nearly same working hours at the three Sites.

That of Nos. 42 to 75 was begun earliest at the Upper Site (Belra and latest at the lowest Site (Kamhera) time being allowed for the water to pass from the Upper to the Lower Sites

Simultaneous Discharge Measurements

Comparison No	Date 18[illegible]	Upper Site							Lower Sites																	Discrepancy in Discharge		Probable cause of Discrepancy.
		Belra							Distributaries.	Jaoli							Kamhera							Total Cubic Discharge	Gain + Loss −		
		Depth		Wind				Cubic Discharge		Depth		Wind				Cubic Discharge	Depth		Wind				Cubic Discharge				
				From		To						From		To					From		To						
		Gauge	Variation	Direction	Velocity	Direction	Velocity		Cubic Discharge	Gauge	Variation	Direction	Velocity	Direction	Velocity		Gauge	Variation	Direction	Velocity	Direction	Velocity			Actual.	Per cent [of max.]	
32	9 1	7·50	00		0	..	0	5 751	24	7 28	+ 01	V	1	V	7	4 813	5 99	− 02		0	..	0	831	5 887	+ 136	2 3	?
33	10·1	44	− 02	S	6		0	5 739	25	16	00	N	6	NE	7	4 643	98	− 01	V	1	V	1	825	5 725	− 14	2	?
34	17 1	04	+ 03	N	7	NW	8	5 431	295	6 54	− 02	W	11	W	14	4 201	6 01	− 02	N	10	N	18	863	5 362	− 69	1 3	High wind
35	21 1	03	00		0	.	0	5,364	20	76	− 04	..	0	S	4	4 478	5 61	00	..	0	..	0	774	5 461	+ 97	1 8	?
36	22 1	01	+ 02	N	3	NW	4	5 309	22	68	− 02	NW	7	W	17	4 488	61	00	N	13	N	15	794	5 503	+ 194	3 5	High wind.
37	25 1	6 76	00	N	1	..	0	5 311	284	26	00	W	6	W	12	4 024	6 11	00	NNW	9	NNW	10	880	5 188	− 123	2 3	? High wind.
38	27 1	70	00	S	1		0	5 142	280	17	− 04	E	6	E	5	3 970	14	00	V	1	..	0	897	5 147	+ 5	1	?
39	28 1	44	+ 04		0		0	4 934	280	5 93	− 04	.	0	SW	6	3 646	12	00		0	V	1	877	4 803	− 131	2 7	?
40	30 1	33	00	.	0	.	0	4 745	265	74	00		0	W	6	3 687	15	00	.	0	NW	9	900	4 850	+ 105	2 2	?
41	31·1	21	00	NNW	7	NW	5	4 718	255	60	00	W	20	W	25	3 416	20	+ 01	NNW	10	N	23	921	4 592	− 126	2 7	High wind

Discharge Measurements in same body of water

42	5	6 02	00		0		0	4 9	2	5 42	00	SW	11	SW	13	3 240	6 34	02	NNW	12	NW	7	916	4 44	− 135	3 0	High wind
43	4	28	00		0		0	4 91	2	62	00	N	3	S	4	3 37	44	02		0	W	7	518	4 576	210	4	?
44	6	41	00		0	N	7	4 80	1	74	00	W	14	W	20	3 84	56	+ 03	NNW	18	NNW	18	98	4 8	− 18	4	High wind
45	7 2	37	− 02		0	N	7	4 51	5	65	00	W	5	SW	10	3 5	51	00	N	13	N	8	567	4 545	− 242	5 1	High wind
46	8	32	00	W	7		0	4 826	247	85	00	SW	10	W	11	3 6	5 80	00	W	7	N	7	812	4 654	− 172	3 6	?
47	10-	27	00		0		6	4 24	24	84	01		0	N	5	3 61	55	00	W	7	W	7	68	4 63	52	2 0	?
48	11	5 88	0		0		0	4 41	24	37	06	E	4	SE	4	3 9	55	00		0	W	7	72	4 30	106	2 4	?
49	13 2	82	00		0	N	7	4 481	21	34	04	W	14	W	2	3 33	53	00	N	14	N	14	786	4 236	245	5 5	High wind
50	14	74	00		0		0	4 4	191	39	00	W	7	N	3	3 294	41	00		0		0	46	4 231	− 1	4	?
51	1 2	6 50	+ 04	N	7	N	7	4 718	12	6 31	+ 02	N	6	W	4	3 923	39	00		0		0	777	4 827	+ 100	2 3	?
52	18	53	− 01	N	7		0	4 941	11	33	00	N	4	N	8	4 00	46	00		0		0	61	4 880	61	1 2	?
53	20 2	49	− 01		0		0	4 7 7	1	20	00	NW	16	W	7	3 844	28	00	W	7	W	7	738	4 73	− 40	8	?
54	2	41	00		0		0	4 8 0	174	01	00		0	NW	1	3 7 8	54	00		0		0	80	4 741	− 89	1 8	?
55	24	05	− 05		0	S	7	5 14	0	74	05		0	S	13	4 330	47	00		0	W	7	744	5 074	− 75	1	Water fell 08
56	25 2	70	− 02		0	N	7	5 083	0	60	00		0	N	8	4 135	45	00		0	W	7	74	4 88	− 203	4 0	?
57		75	− 01	N	7	N	7	4 581	0	57	02	N	6	NW	6	4 199	45	00		0	W	7	748	4 94	− 37	7	?
58	2 2	51	− 05		0		0	4 76	0	23	04	W	10	NW	13	3 920	73	− 01	NW	8	NW	9	8 4	4 744	− 18	4	?
59		45	− 03		0	N	7	4 56	0	23	00	W	10	NW	20	3 505	72	00	NW	11	NW	11	818	4 72	− 73	1 5	High wind
60	8	43	− 02		0	N	7	4 780	0	10	04	NW	10	W	35	3 840	72	00	NW	10	NW	11	818	4 658	− 128	2 7	High wind
61	4 3	5 82	00	W	7	N	7	4 261	151	5 41	+ 04	SW	6	W	2	3 29	5	00	W	7	NW	15	707	4 240	− 121	2 8	High wind.
62	6	91	00	N	7		0	4 33	108	52	00	NW	11	W	10	3 494	23	00	W	7	W	7	711	4 303	− 27	6	?
63	7	04	− 03		0		0	4 291	147	59	+ 02		0	NNW	5	3 491	33	00		0		0	734	4 372	+ 88	2 0	?
64	8	92	00		0		0	4 288	147	55	+ 10		0	SW	8	3 366	41	+ 01		0		0	731	4 247	− 41	1 0	?
65	11	75	− 05		0	N	19	4 166	14	21	00	E	11	SE	7	3 209	55	00	N	6	N	13	746	4 05	− 69	1 7	High wind
66	13	6 07	+ 26	S	7		0	4 900	171	6 11	+ 32		0	N	11	3 943	36	00		0		0	737	4 851	− 49	1 0	Water rose 32
67	1	83	+ 14		0		7	5 10	9	50	+ 20	SW	5	W	3	4 146	30	00	N	3	W	7	776	4 96	− 144	2 8	Water rose 20
68	17	7 29	− 02	N	7	N	7	5 36	62	7 07	− 04	NW	10	W	20	4 455	31	01	NNW	16	NNW	18	75	5 231	− 73	1 4	High wind
69	18 5	20	00		0		0	5 324	143	6 80	− 04	W	7	SW	9	4 384	27	02		0	W	7	715	5 246	− 78	1 5	?
70	0	0 86	− 08		0		0	5 174	150	29	06	W	8	W	11	3 8	6 21	− 01	N	11	N	11	905	5 042	− 132	2 6	High wind
71	21 3	53	− 02		0		0	4 815	140	05	− 06	W	8	W	14	3 701	5 89	00	N	13	N	13	838	4 675	− 136	2 8	High wind
72		51	− 01		0		0	4 781	150	01	+ 02	SW	8	SW	1	3 875	88	00	NW	12	NW	11	86	4 891	+ 110	2 3	High wind
73	21 3	45	− 01		0		0	4 72	51	09	+ 04	W	20	W	25	3 9 3	69	+ 02	NW	11	NW	10	80	4 774	+ 49	1 0	High wind
74	2 3	00	00		0	S	11	5 19	35	53	+ 02	E	17	E	1	4 200	75	01	E	9	E	9	818	5 06	− 128	2 5	High wind
75	7 5	7 54	− 07		0		0	5 43	2	7 32	− 12		0		0	4 754	54	00		0		0	75	5 536	+ 104	1 9	Water fell 12

RANGE OF CONDITIONS AND OF RESULTS. ABSTRACT TABLE 32.

Nature of Work		SITES	Serial No	Number of Sets	RANGE OF EXTERNAL CONDITIONS AND OTHER DATA.								
					At ends of Reach				At Experimental Site				
					Head Gauge	With drawal by Distributaries Q	Tail Gauge	Obstruction at Tail.	Gauge Reading	Depth on Expl Vert or Hydr Mean	Central Depth D	Surface Breadth b	Wind Velocy.
VERTL. VELY-CURVES	CENTRAL	Solání Left Aqueduct,	1 4	58	3 6—5 2	Not observed	4 0—3 2	?	9 5—5 9	9 5—5 9 on Experimental Vertical	9 5—5 9	85—82	30—0
		Solání Right Aqueduct,	5- 17	165	4—5 3		4 7—2 3	? 47—0	10 0—5 6	10 0—5 6	10 0—5 6	85—82	25—0
		Solání Right Aqueduct, [Left Aqueduct closed.]	18 20	22	4 5—4 0		2 8	?	4 7—3 9	4 7—3 9	4 7—3 9	85	12—0
		Solání Embankment, (Main Site)	21- 28	99	2—4 1		4 2—2 5	? 67—0	9 8—4 9	11 0—6 0	11 0—6 0	170—155	21—0
	NON CENTRAL	Solání Right Aqueduct,	29 40	154	3 8—6 7	Not observed	4 0—3 3	?0—0	9 6—6 9	9 6—6 9	9 6—6 9	85—87	21—0
		Solání Embankment, (Main Site)	41- 46	67	3—6 7		4 3—3 3	?0—0	9 7—7 5	8 9—2 5	10 9—8 7	169—162	25—0
TRANSVERSE VELOCITY CURVES.	SURFACE	Solání Left Aqueduct,	51- 52	29	3 2—7 9	Not observed	3 9—3 8	?0—0	9 1—8 8	7 4—7 3 Hydraulic Mean Depth	9 1—8 8	84	15—0
		Solání Right Aqueduct,	53 59	70	4—7 0		4 4—3 3	?—0	10 0—7 5	7 9—6 5	10 0—7 5	85—82	23—0
		Solání Embankment, (Minor Site)	60	10	3 1—8 0		3 3—3 8	?	9 7—9 5	?	10 3—10 2	169—168	27—0
	MID	Solání Right Aqueduct	61- 62	17	5—8 3	?	4 3—4 1	?0—0	10 1—9 1	8 0—7 5	10 1—9 1	84—82	19—0
	BED	Solání Right Aqueduct,	65 66	7	9 5—7 8	?	4 3—3 7	?0—0	10 0—8 7	8 0—7 3	10 0—8 7	84—82	20—0
	MEAN VELOCITIES	*Solání Left Aqueduct,*	101-107	45	4—6 7	266—0	4 5—3 3	?—0	10 0—7 4	7 9—6 4	10 0—7 4	85—82	20—0
		Solání Right Aqueduct	108 127	174	4—1 3	333—0	4 5—1 4	?3 08—0	10 0—7	8 0—7	10 0—7	85—82	23—0
		Solání Right Aqueduct, [Left Aqueduct closed]	131 139	12	6—1 4	247—0	4 3—2 3	?3 08—0	4 6—2 6	4 2—2 5	4 6—2 6	85	12—0
		Solání Embkt. Main site	151-181	153	4—1 2	285—0	4 5—9	?2 67—0	10 0—4	9 3—1 7	11 2—1 5	171—150	27—0
		Fifteenth Mile,	191-197	17	9 3—6 3	?68—0	4 3—3 2	0	15 3—12 5	9 5—8 4	11 0—8 2	186—171	14—0
		Belra,	201 206	53	3 6—1 8	298—0	3 6—3 0	·56—0	7 5—5 7	9 0—7 6	9 9—8 0	189—187	19—0
		Jaoli,	211 217	55	—4 2	100—0	3 8—2 8	1 00—0	7 3—6 2	7 8—6 3	8 7—6 7	193—191	33—0
		Kambera,	221 225	56	3—9	102—0	3 8—3 1	1 26	6 6—5 3	4 8—4 1	5 7—4 4	66—64	23—0
		Distributaries Right Jaoli,	231 232	4	?	Not required.	?	?	4 4—3 1	2 8—2 0	3 8—2 6	25—22	0
		Distributaries Mansurpur,	233 234	5	?		?	?	4 1—3 6	2 3—2 1	3 6—3·1	14	7—0
		Distributaries Mitranpur,	235 236	3	?		?	?	3 8—2 8	1 6—1 2	2 1—1·4	14	5—0
		Distributaries Pimora,	237 238	4	?		?	?	3 8—3 3	2 2—1 9	3 4—2·9	13	6—0

						RANGE OF RESULTS												
Nature of Work			SITES	Serial No	Number of Sets	SURFACE FALL			CHIEF VELOCITIES (Each entry is mean of 3 trials)			DISCHARGE Supl or Cubic	CENTRAL SURF VELOCITY (Each entry is a mean of 4 trials)			SURFACE SLOPE		
						Sub Reaches			Surface or Central	Mean	$U - v_0$ or $V - U_0$	In sq ft or c ft per sec	Expts.	Velocity	Ratio $V - v_0$	Expts.	Slope	Ratio $V - w$
						Upper	Middle	Lower										
						F_1	F_1	F_2	v_0 or U_0	U or V	C or c	D or D		v_0	C		S	C
VERTICAL VELY CURVES.	CENTRAL	SOLANI SITES	L. Aqueduct, ..	See paper head of Table.	58	9—56	No Middle Sub-Reach	54—25	Surface (v_0) 4 69—3 45	4 20—3 26	96—94	Superficial (D) 39—19		see previous column of v_0	..	0	?	Slope seldom observed
			R. Aqueduct, .		165	6—8		55—25	4 88—3 51	4 73—3 55	1 01—96	47—20			..	25	300—143	
			R Aqueduct (L. Aqueduct closed) .		22	7—63		17—9	7 66—5 31	6 58—5 27	1 00—97	31—21			..	0	?	
			Embankment (Main Site)		99	3—45	15—9	55—11	4 65—2 67	4 45—2 54	1 00—93	48—15	.		..	5	238—103	
	NON CENTRAL		R Aqueduct, .		154	1—57	..	54—39	Surf (v_0) 4 35—2 05	4 27—2 51	1 13—96	S pd (D) 40—18	.	Not observed.	..	13	?350—100	
			Embankment, (Main Site)		67	2—45	14—11	54—36	3 57—2 34	3 54—2 20	97—83	23—6			..	16	233—200	
TRANSVERSE VELOCITY-CURVES.	SURFACE	SOLANI SITES	L. Aqueduct, ..		29	8—57	No Middle Sub-Reach	50—48	Central (v_0) 4 48—4 00	4 00—3 71	91	Supd (D) 340—316	.	see previous column of v_0	..	0	?	Slope seldom observed
			R Aqueduct, ..		70	72—57		55—38	5 13—3 85	4 61—3 60	94—91	399—300	.		..	17	233—178	
			Embankment (Minor & tail)		10	8—57		50—49	4 55—3 90	4 21—3 94	96	708—661	..		..	0	?	
	MID		R. Aqueduct, ..		17	61—57	No Middle Sub-Reach	57—47	Central (v_0) 4 88—4 20	4 54—4 10	96—93	Supd (D) 878—348	.	Not observed.	..	1	210	
	BED		R. Aqueduct, ..		7	61—58	No Middle Sub-Reach	56—48	Central (v_0) 4 55—3 57	4 24—3 42	95—94	Supd (D) 361—291	..	Not observed	..	0	?	
	MEAN VELOCITIES	SOLANI SITES	L. Aqueduct, ..		45	60—56	No Middle Sub-Reach	56—39	Central & mean (U_0) 4 44—3 31	4 12—3 34	98—94	Cubic (D) 5,441—2,631	(	4 05	85	16	235—183	1 06—·89
			R Aqueduct, ..		174	78—43		57—1	4 69—57	4 35—60	1·05—90	3,651—36	56	4 78—1 83	9?—84	78	330—113	1 19—66
			R. Aqueduct (L. Aqueduct closed) ..		11	5—36		10—·0	5 17—71	4 87—69	·97—87	1,648—212	10	5 79—1 42	89—79	10	480—024	1 30—1 05
			Embkt, Mainsite		153	70—34	21—1	60—0	4 55—41	4 11—44	1 10—89	7,364—114	71	4 70—83	1 01—80	92	323—038	1·07—35
			Fifteenth Mile, ..		17	3—21	38—36	55—3·7	4 55—3 66	4 26—3 51	96—91	7,187—4,370	17	4 91—4 21	91—89	16	253—7215	? 90—83
		LOWER SITES	Belra, ...		53	12—4	No Middle Sub-Reach	41—24	3 47—2 67	3 27—2 79	99—97	760—4 084	47	3 78—3 26	92—89	50	255—168	81—66
			Jaoli, ...		55	6—2		56—35	3 37—2 65	3 06—2 57	97—93	4,813—3,202	53	3 55—3 02	92—80	51	183—129	·93—78
			Kambera .		56	31—26		119—102	3 33—2 52	2 95—2 63	98—93	982—711	50	3 54—2 90	94—81	50	316—267	·82—74
		DISTRIBUTARIES	R Jaoli, ..		4	No Observations			2 73—2 24	2 52—2 10	94—91	191—98	2	2 95—2 51	85—84	..	Slope not observed	..
			Mansurpur, .		5				2 48—2 26	2 14—2 03	·90—69	91—73	3	2 49—2 43	86—84	..		..
			Miranpur, ..		3				1·67—1 58	1 59—1 49	95—94	41—25	1	1 79	83	..		..
			Jumora, ..		4				2 13—1 92	1 84—1 71	88—87	63—48	2	2 26—2 09	86—81	..		..

ABSTRACT TABLE 33.

SPECIMEN FIELD BOOK.

Details for Series 201, *line* 2, (9-1-'79)

NATURE OF WORK, *MEAN VELOCITIES* DATE, *9 1-'79*

Place, *Belra Site*
Run, *50 feet* Watersurface, *188·49 feet*
Vertical of Experiment, (*see "Explanation"*) Instrument, 1" *tin Rods.*
Gauge Reading, (1), *7 50* (2), *7 50* (3) .. .. (4) ..
Wind (1), *None.* (2), *None* (3) .. .. (4) ..
Commenced, *1 10 p m* Ended, *4 p m.*

Abscissa.	No	FIRST SET,				SECOND SET				Remarks [Rods used]
		Times		D	M D *v*	Times		D	M D. *v*	
		U	L.			U.	L			
m, L	1 2 3	9 2 5 15	55 56 61	46 53 5 46	48 50 2 06					2
90, L	1 2 3	9 3 12	50 41 54	41 38 42	40 33 2 48					6'
80, L	1 2 3	9 3 18	40 34 49	31 31 31	31 00 3 23					8
70, L	1 2 3	7 5 15 3	36 47 31	28 5 32 28	29 50 3 39					8½
60, L	1 2 3	7 14 9	37 44 41	30 30 32	30 67 3 26					8½
40, L	1 2 3	7 4 9	38 34 38	31 30 29	30 00 3 33					8½'
20, L	1 2 3	1 5 14 5	31 37 44	30 32 29 5	30 50 3 28					9
Centre	1 2 3	9 22 6	41 54 36	32 32 30	31 33 3 19					8½
20, R	1 2 3	9 1 5 7	39 29 33	30 27 5 26	27 83 3 59					8½
40, R	1 2 3	3 12 5	34 42 37	31 30 32	31 00 3 23					9'
60, R	1 2 3	1 8 5	30 35 35	29 27 30	28 67 3 49					9'
70, R	1 2 3	3 6 6	36 33 36	33 27 30	30 00 3 33					9
80, R	1 2 3	4 3 10	37 36 43	33 33 33	33 00 3 03					8½
90, R	1 2 3	1 6 17	44 45 56	43 39 39	40 33 2 48					4'
m, R	1 2 3	1 8 12	65 57 58	64 49 46	53 00 1 89					1½'

If a second SET of similar Field work were done on same day the entries would be made here
The Gauge-Readings and Winds at beginning and end of second Set would be entered as Nos (3) (4) in the Heading

Explanation —This Form served for velocity work past either a vertical or transversal The present specimen (Mean Velocity work) is of latter sort
[In the former case the " position " of the Vertical of Experiment would have been filled up in the Heading, and the word " Depth " substituted for Abscissa at head of left Column]

Heading { The portion of the Heading in italics was filled in the Field The rest of the Heading was ready printed
The Gauge-Readings and Wind entries Nos 1 2 are those noted at beginning and end of the First Set of velocity work

Columns. { The Column " Abscissa " shows the distance (± *y*) of each Float Course to right or left (R L) of centre
The Columns U L contain the number of chronometer beats counted at passage of each Float under the Upper and Lower Ropes respectively
Column D contains the difference between the numbers in Cols U L (*i.e.* the time (in half seconds) of passage of each Float through the 50 Run
Col M D and *v* contains two entries whereof the upper (M D) is the mean difference (mean of each trio of differences in Col. D,) *i.e.*, the mean time of passage through the 50 Run and the lower (*v*) is the velocity corresponding (which may be taken by inspection from a Table of Reciprocals)
The velocities (*v*) were filled in in office The rest of the entries were made in the field.

ABSTRACT TABLE 34.

SPECIMEN OF COMPUTATION OF CUBIC DISCHARGE

BELRA SITE

These are the details of computation of the Discharge-Result (D) shown in line 2 of Series 201, 9 1 '79

Date, 1879	Gauge-Reading	Surface-Breadth	Description of Line.	STEP I COMPUTATION OF DISCHARGES (D → Hu) PAST EACH VERTICAL																
				Simson's		Cubic			Weddle's							Cubic			Simson's	
				Left of Centre								Centre	Right of Centre							
	h	b		Edge	m	90	80	70	60	40	20		20	40	60	70	80	90	m	Edge.
8 1	7 52	188 51	Soundings[1],	..	..	6 41	9 51	9 83	9 78	9 50	10 13	9 65	10 13	10 25	10 45	10 36	9 71	6 01	..	..
0 1	7 50	188 49	Depths[2], H =	0	4 25	6 39	9 49	9 81	9 76	9 48	10 11	9 63	10 11	10 26	10 46	10 34	9 69	5 09	4 25	0
			Rod velocities[3], u =	70	2 06	2 48	3 23	3 39	3 26	3 33	3 28	3 19	3 59	3 23	3 49	3 33	3 03	2 48	1 89	70
			Discharges[4], Hu past each vertical,	0	..	15 85	..	..	31 82	..	33 16	30 72	36 29	..	36 51	..	..	14 86	..	0
				..	8 76	..	30 63	33 26	..	31 57	..	30 72	..	33 14	..	34 43	20 86	..	8 03	..

	Simson's	Cubic	Weddle's	Cubic	Simson's
STEP II. COMPUTATION OF CUBIC DISCHARGE.	4 × 8 76 = 35 04 15 85 6)50 89 8 48 4 25	3 × 63 91 = 191 73 47 67 239 40 $\frac{3}{8}$ × 10 = $\frac{30}{8}$ 30 8)7182 00	5 × 95 43 = 477 15 168 50 645 65 $\frac{3}{10}$ × 20 = 6	3 × 63 79 = 191 37 51 37 242 74 $\frac{3}{8}$ × 10 = $\frac{30}{8}$ 30 8)7282 20	4 × 8 03 = 32 12 14 86 6)46 98 7 83 4 25
Total Cubic Discharge D = 5751·25 } = Sum of	.. .. .. 36 04	.. .. 897 75	.. .. .. 3873 90	.. .. .. 910 28	.. .. .. 33 28

[1] The Soundings are deduced from Detailed Table II [2] The depths (H) are obtained by subtracting the fall (·02) of water-level from the Soundings except at the m-Pendants the depth at which is—(since the side-slopes are 1 in 2)—accurately given as ¼ × difference of surface-breadth 188·49) and bed width (180) [3] The Rod velocities (u) are taken direct from the Field Book (Table 33). [4] The products Hu are ranged in two lines so as to admit of rapid addition of the ordinates (horizontally by inspection) as required in the several formulæ (Weddle's, Cubic, Simson's).

END OF TABLES